OFF-SHORE AND OFF WORK

The future of Australian service industries in a global economy

A call to action

A report for the
Services Unions of Australia

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May 2008

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Project objectives

Off-shoring of service sector jobs has been emerging as an important issue impacting employees for a number of years. Banks and other service sector employers have been interested in Off-shoring as a way of benefiting from lower wage rates in less developed countries. However, they have been constrained by concerns about the potential impact on their brand and customer loyalty. As Off-shoring gathers pace internationally, it can be expected that these efforts will continue and competitive pressure will be cited as justification. The Services Unions of Australia have mounted successful campaigns to date around issues such as local employment and privacy concerns of customers. They are now looking to develop a deeper and more sophisticated understanding of the potential impact of Off-shoring and policy options that could be put forward in order to benefit Australian employees.

NIEIR has been asked by Service Unions of Australia to:

- provide advice on the likely impact of Off-shoring based on at least three different scenarios; base case, high and low scenarios;
- provide advice on how the impact of those scenarios will be distributed through the Australian economy and workforce, and;
- develop policy options that could be proposed to governments and industry to ensure Australian workers are not disadvantaged by these global trends.

Executive summary

Australia's services industries are often seen as the back-up to Plan A. If China's hunger for resources abates there will always be services as a fall back. Manufacturing is in a downward spiral and agriculture has not only declined, it faces an uncertain future due to global warming. But the sector that employs more Australians than any other is in poor shape. It is not holding its own in international markets for traded services. In fact it is losing market share. More jobs than ever are being moved off-shore. Without Plan B - a strong services sector - what is Australia's future should China stumble?

This report is not the first to draw attention to the poor state of Australia's services sector. Last year, the Business Council of Australia[1] formed a similarly pessimistic view of the state of sector. This report builds on what is known about the state of the services sector and asks how bad can it get? It estimates that Australia could lose up to one in ten service sector jobs over the next 20 years. About 850,000 jobs are at risk. Australia stands at the cusp of a vicious cycle of off-shoring jobs, losing skills and competencies from the domestic economy and as a result, losing more jobs off-shore.

The clock is ticking for concerted action to address this vicious cycle of job loss, skills loss and loss of competencies. A worst case scenario could see Australia losing 1,000 jobs a week off-shore over the next 20 years. Unlike the experience of Australia's manufacturing sector, these would not be the lower skilled jobs. Almost all would be high skill or intermediate skill jobs. The low skill jobs requiring face to face communication would remain. The sector would effectively be de-skilled. By highlighting the threat to the sector and the jobs at risk, this report is both a wake-up call and a call to action.

E.1 Off-shoring jobs and the global economy in services

The evolution of a global economy in services has its origins in the communications revolution that started with the fall in international telephony costs from the 1980s and continued with the introduction of broadband in the 1990s. This revolution has eliminated or reduced natural barriers of protection for selected service industries and, more importantly, occupations. Lower communication costs create the possibility for many services to be performed or delivered from virtually anywhere in the world. This trend will over time create international centres of expertise for service development, production and delivery. A number of countries have been actively pursuing opportunities to develop globally focused service economies. Australia does not have such a strategy. It is losing ground and jobs.

Off-shoring is the continuation of the outsourcing phenomenon of the 1980s and 1990s. The difference is that in the past outsourcing, in the service sector at least, involved transfers of employment within the national economy. Off-shoring involves the transfer of employment from one country to another. This report identifies two types of off-shoring:

- industry off-shoring occurs when a whole service division or firm that previously developed or delivered services in Australia is transferred off-shore. This may mean that a firm loses all or part of its business to an off-shore competitor;
- on the other hand, if some of the functions of the firm, such as telemarketing or statistical analysis, are moved off-shore with the remaining functions carried out in Australia, then this is referred to as occupational off-shoring.

[1] *Unserviced: Why Australia's Services Economy Deserves More Attention*, Business Council of Australia, Discussion Paper July 2007.

E.2 An expanding range of jobs being performed internationally

In the short-term, the following seven characteristics identify the types of service jobs more likely than others to be off-shored:

1. heavy reliance on information technology and routine or rule-based work;
2. lack of need for personal contact with customers;
3. wage cost savings in low-wage countries that outweigh productivity losses;
4. tradability;
5. availability of skills abroad;
6. labour intensiveness, ease of physical relocation and separability of jobs tasks from other parts of the production process; and
7. absence of cultural, institutional and legal barriers.

In the longer term, the potential for off-shoring will increase because the speed, capability and coverage of broadband infrastructure will steadily improve and international service centres will continue to develop scale and skills that provide global competitive advantage.

At some point in the future, the virtual office will become a reality. Only services that require face to face contact (nursing, wait staff) will be tied to a particular location. Services industries will be based on a global workforce with firms seeking to maximise efficiency and competitive advantage based on global availability of skills, scale, quality, innovation and cost competitiveness. At this point, employment in many parts of the sector will be premised on globally contestable remuneration and costs.

E.3 How this study identified jobs at risk in Australia

This study takes a rigorous quantitative approach based on the following simple concept: Existing patterns of service delivery (within a country) are an indicator of services and occupations that can be outsourced to foreign countries. If an industry or occupation is not strongly concentrated by region, then it is an indication that proximity to clients and markets is a competitive advantage. If, on the other hand, after adjustment for industry structure, it is found that industries or occupations are concentrated by region then it is an indication that within a national economy these industries and occupations are capable of a high level of inter-regional trade. If services of industries and occupations can be internally traded in an economy, it is a good indication that they could be traded internationally. There has to be adjustments to the results because for some services, even if they are technically capable of being traded, for example a Government service, the reality is that they will not be traded. However, all adjustments made to the outcomes of the application of the methodology in the study are transparent.

E.4 Key findings

One in ten service sector jobs at risk

This study finds that (for the base case) 850,000 Australian jobs are at risk of being lost off-shore over the next two decades (Table E.1). This represents just under 10 per cent of total service sector employment and 8.2 per cent of total employment. As the population grows, the absolute number of jobs at risk will increase to about 1.1 million even if the percentage remains unchanged. These estimates are at the low end of the range of estimates, both for the United States and Australia. The main reason is the more realistic assessment criteria for employment at risk that have been used.

The study also found that the majority of employment losses will be concentrated in the professional and managerial skill occupations. From Table E.1, 60 per cent of the employment losses will be in this skill category. Just under a third of the potential employment losses will be in the intermediate occupation skill categories, while 7 per cent will be in the low skill categories.

Table E.1 Number of employment by broad skill occupations lost from Off-shoring over next two decades – based on occupational employment levels 2006 (thousands)

	Base scenario	High scenario	Low scenario
High skilled	511.6	606.0	412.7
Intermediate skilled	272.1	315.1	228.6
Low skilled	65.9	76.4	55.2
Total	**849.6**	**997.6**	**696.4**
Per cent			
High skilled	60.2	60.7	59.3
Intermediate skilled	32.0	31.6	32.8
Low skilled	7.8	7.7	7.9
Total	100.0	100.0	100.0
Total (of service sector employment)	9.7	11.4	8.0
Per cent of total employment	8.2	9.7	6.8

Largest declines in information technology and related occupations

Table E.2 profiles the largest assessed potential employment losses by occupation. The largest absolute potential declines are for the information technology related occupations. It should be noted that the presence of occupations in the list that would not, a priori, be expected to be influenced by off-shoring can come about from industry off-shoring. Industry off-shoring (as defined above) will eliminate all occupations employed in the industry, not just those occupations which can be directly off-shored.

Flow on effects increase employment losses by a further 30 per cent

One flow-on effect from off-shoring jobs is the reduction in consumption expenditure from those displaced. The study estimates that the traditional multiplier mechanism will increase the employment losses by 30 per cent from the estimates shown in Table E.1. However,

there will be positive offsets. By allowing a reduction in costs to Australian based enterprises off-shoring will:

(i) increase profitability;

(ii) allow output prices to be reduced; thereby

(iii) increasing investment, exports, and real demand as well as tending to reduce import penetration.

These factors will be an offset to the direct employment losses from off-shoring. The question is by how much?

Benefits from off-shoring lost through transfer of income to other countries

If employment loss is caused by an increase in labour productivity or by domestic outsourcing, then all the income gains and losses would be contained within Australia. In the base case scenario the effect of this would be a net increase in household consumption of the order of $9 billion and employment loss (as well as flow-on impacts from employment loss) would be neutralised. However, off-shoring, unlike domestic outsourcing, involves a significant income transfer to foreign jurisdictions. In this report, the standard assumption adopted is that on average 40 per cent of cost savings are retained in foreign jurisdictions. The impact of this loss to foreign jurisdictions is that the benefits identified from off-shoring are offset. In other words, while there are benefits to the Australian economy from off-shoring these benefits are neutralised because a proportion of these benefits are retained off-shore. So the employment impact is not substantially different after these issues have been taken into account.

Increase in inequality of income distribution

Off-shoring will impact income distribution in Australia. Job losses in the high income managerial and professional occupations will increase the equality of the distribution of income. However, this will be more than offset by job losses in the intermediate clerical, sales and services occupations. The net effect will be an increase in the inequality of income distribution from employment.

Cities and regional centres face the greatest threat

The potential loss of jobs off-shore will not be even geographically but felt most in cities and regional centres. This is because cities and regional centres are effectively hubs for service delivery and therefore concentrate the sorts of jobs that could potentially be moved off-shore. Appendix 1 illustrates the geographic distribution of jobs that could potentially be off- shored.

Table E.2	Number of employment by four digit ASCO occupations lost from Off-shoring over next two decades – based on occupational employment levels 2006 – total impact (thousands)		
	Base scenario	**High scenario**	**Low scenario**
1112 General managers	11.4	12.5	10.2
1192 Importers, exporters and wholesalers	6.1	7.1	5.2
1211 Finance managers	10.7	12.6	8.7
1213 Human resource managers	6.9	8.2	5.6
1223 Supply and distribution managers	5.6	6.8	4.4
1224 Information technology managers	15.2	18.9	11.2
1231 Sales and marketing managers	25.9	30.6	21.1
1299 Other specialist managers	4.8	5.4	4.3
2115 Medical scientists	5.3	6.5	4.1
2125 Electrical and electronics engineers	4.3	5.1	3.5
2211 Accountants	34.3	40.1	28.4
2221 Marketing and advertising professionals	13.3	15.7	10.9
2222 Technical sales representatives	8.5	10.1	6.8
2231 Computing professionals	81.2	102.1	58.4
2291 Human resource professionals	12.1	13.5	10.6
2294 Business and organisation analysts	7.6	8.5	6.7
2299 Other business and information professionals	12.1	15.9	8.2
2421 University lecturers and tutors	8.8	10.3	7.2
2521 Legal professionals	14.7	17.2	12.1
2533 Designers and illustrators	16.8	21.3	12.1
2541 Air transport professionals	5.8	7.7	3.9
3211 Branch accountants and managers (financial institution)	5.6	6.2	4.9
3212 Financial dealers and brokers	18.2	21.9	14.5
3213 Financial investment advisers	8.8	10.5	7.0
3291 Office managers	11.0	9.2	12.8
3292 Project and program administrators	25.2	30.9	19.4
3293 Real estate associate professionals	9.5	10.3	8.8
3294 Computing support technicians	22.4	28.5	15.7
3392 Customer service managers	5.9	6.7	5.1
4315 Electronic and office equipment tradespersons	9.6	11.6	7.5
4316 Communications tradespersons	6.2	8.7	3.7
5111 Secretaries and personal assistants	24.5	26.4	22.5
5911 Bookkeepers	6.1	7.5	4.7
5912 Credit and loans officers	7.7	8.7	6.7
5991 Advanced legal and related clerks	5.1	6.1	4.1
6111 General clerks	31.9	37.2	26.6
6121 Keyboard operators	26.5	32.9	19.8
6131 Receptionists	4.6	5.7	3.5
6141 Accounting clerks	28.0	34.2	21.7
6142 Payroll clerks	7.5	9.2	5.8
6143 Bank workers	23.1	27.3	18.7

Table E.2	Number of employment by four digit ASCO occupations lost from Off-shoring over next two decades – based on occupational employment levels 2006 – total impact (thousands) – continued		
	Base scenario	**High scenario**	**Low scenario**
6152 Transport and despatching clerks	4.6	5.0	4.2
6153 Stock and purchasing clerks	14.2	16.8	11.6
6191 Inquiry and admissions clerks	10.3	10.3	10.5
6211 Sales representatives	10.7	9.7	11.8
6397 Travel and tourism agents	6.7	8.1	5.3
7993 Storepersons	5.3	5.8	4.7
8211 Sales assistants	7.3	8.8	5.8
8294 Telemarketers	8.0	10.2	5.7
8319 Other elementary service workers	12.9	15.4	10.3
Total	**849.6**	**997.6**	**696.4**

E.5 The way forward

Australia needs a service industries strategy. This must be led and developed by a Task Force that includes all the relevant players. The Service Industries Task Force should report directly to a Cabinet sub-committee with the capacity to implement recommendations across the whole of government. The strategy needs to focus on identifying capabilities that exist in the Australian economy that can provide the basis for a globally competitive services sector. The objective must be for Australia to establish itself in the global traded services economy. Implementation of the strategy will need to focus on:

- developing stronger linkages between universities, industry bodies, training institutions, business, unions, state and federal governments;
- improving skills through training and other targeted skills development initiatives;
- scaling up parts of the Australian services sector through clusters, networks and mergers;
- encouraging leaders in the services sector capable of building a globally competitive sector;
- development of infrastructure with internationally competitive costs;
- building market linkages into the global services sector;
- investment attraction for companies who can build an international presence for Australia; and
- marketing and branding Australia's key capabilities in the services sector.

The longer-term solution is to grow service sector exports. The direct contribution service sector exports makes to direct employment creation is low, being of the order of 320,000 to 350,000. Over the last half a decade the service sector's exports growth performance has been poor. In order to neutralise the likely loss in employment from off-shoring over the next two decades, service sector exports would have to grow by 8 per cent per annum, with the growth led by business services exports and finance services exports. This is not a big ask in the context of services sector export growth in Asia-Pacific. It is a big ask in the context of recent performance. Policy intervention will be needed.

Short-term strategies should include:

1. review of the tax system to remove any incentives or other benefits to off-shore and create an incentive for companies to develop target competencies in Australia;
2. review Free Trade Agreements to ensure Australian business operates on a level playing field; and
3. introduction of ‘Right to Know’ legislation (similar to ‘Country of Origin’) so domestic customers wanting to support businesses that source services locally will have the ability to do so.

These recommendations are discussed in the final section of this report.

1. Off-shoring: Its meaning and economic context

"Off-shoring" is a word that has come into common usage since the turn of the century. The common interpretation would be that it has negative economic implications for the economy where Off-shoring is occurring. The questions that flow from this are:

- what does Off-shoring mean and when does it occur?
- what are the drivers of Off-shoring?
- what are the drivers of the macro-wide outcome of Off-shoring?

1.1 What does Off-shoring mean?

In technical terms Off-shoring is the replacement of domestically sourced services and/or labour by imported services and/or labour. That is, it is an import replacement activity. Import replacement in services has always been possible. Many business services have been able to be provided from a foreign location and firms have been able to use foreign labour in production. However, in the past the foreign labour was only able to be used on a short-term basis as the requirement has generally been for on-site location in Australia. In terms of foreign provided services, the services provided have generally required local support from service providers in Australia.

The communications revolution has removed the protective devices of the past. The communications revolution has made it possible for more foreign labour located permanently overseas to provide services in Australia, as well as foreign businesses to permanently provide services to local firms with little or no local support.

Hence, what is meant by Off-shoring is that part of import replacement of:

- domestic labour for foreign labour;
- domestic service providers for foreign service providers,

that has occurred and will occur in the future that has been made possible by the communications revolution.

In short, Off-shoring is the import replacement of services and labour used in services that would not have occurred on the basis of communication technologies available pre the 1980s. The sharp decline in international telephony cost over the 1980s kick started the process. However, the next major enabling factor for Off-shoring was the availability of high speed internet services with the introduction of broadband. As broadband speeds become faster and faster over the next two decades, so will the potential for Off-shoring. The end game will be when broadband speeds are fast enough (and capital equipment costs are low enough) to allow the creation and economic feasibility of the virtual office. That is, where technology allows office functions and networking to be as efficiently carried out either by people being located side by side, or being located anywhere around the world.

1.1.1 When does Off-shoring occur?

Off-shoring is now a widely used term. It goes without saying that at the very start we need to be clear of what is meant by the word.

Its basic genesis is as a derivative from outsourcing, which had wide currency in the 1980s and 1990s. This term referred to the outsourcing of employment from an enterprise to another enterprise (for example business service provider), where both enterprises are within the one country. One of the key issues around outsourcing was the transfer of employment out of regions and, in the Australian case, out of States.

From this context Off-shoring represents a change in the regional relationship. That is, Off-shoring represents the transfer, that is outsourcing, of employment from an enterprise in one country to an enterprise in another country. Both enterprises may or may not be affiliated.

There are two mechanisms for transferring employment positions off-shore. They are:

- industry Off-shoring; and
- occupation Off-shoring.

Industry Off-shoring occurs when a complete service is transferred off-shore. Industry Off-shoring is a straight forward case of increase in import penetration that has long been a hallmark of goods production industries. The qualification applying to industry Off-shoring is that it would not have occurred in the absence of the communications revolution.

The key feature of industry Off-shoring is that the result is a voluntary or involuntary reduction in an existing firm's total domestic revenue which, in the extreme case, may result in a cessation in a firm's operations. Industry Off-shoring occurs when services previously offered to customers from domestic sites are now offered from foreign sites. That is, most of the labour involved in the service provision is located off-shore.

Occupation Off-shoring occurs when a function or group of functions within an enterprise are transferred off-shore. An enterprise's total domestic revenue remains unchanged and the services offered from domestic locations remains unchanged. However, part of the labour involved in providing the services are now located in foreign jurisdictions.

1.2 The drivers of Off-shoring

The OECD in its study "*Off-shoring and employment: Trends and Impacts*", 2007, quotes the results of savings of firms designed to show the motivation for outsourcing.

A survey of large firms produced the following percentage of respondents who gave the following top motivations for Off-shoring as the main driver:

- reduce costs (36 per cent);
- proximity to clients (17 per cent);
- increase sales (14 per cent);
- improve productivity (13 per cent); and
- market access (9 per cent).

A survey of SMEs produced the result that between 75 and 84 per cent of respondents gave pricing, i.e. lower cost, as an important reason for Off-shoring.

Relocation of head or regional offices is also a form of outsourcing. Another survey quoted in the OECD report ranked the following criteria as important in relocation decisions:

- corporate tax advantages (88 per cent);
- availability of qualified managers (72 per cent);
- quality of life (69 per cent);
- central location (62 per cent);
- support of authorities (55 per cent); and
- personal preference of CEO (50 per cent).

The above motivations have existed from time immemorial. The focus of this study is firmly focussed on Off-shoring that has been made possible with the communication technology revolution which started with the rapid reduction in international telephone costs over the 1980s and the introduction of the Internet and broadband over the 1990s.

In the context of the communications revolution, induced outsourcing, subject to the technology constraints to the ability to off-shore, will be a function of:

(i) the number of suitably qualified potential employees available to occupy the off-shore positions;

(ii) the labour and on-costs of off-shore labour; and

(iii) the number of potential employment positions that can be moved off-shore.

India, to this point in time, has had a competitive advantage in Off-shoring exports because of:

(i) high English language skills;

(ii) available pools of tertiary educated personnel suitable for supplying off-shore functions; and

(iii) low wage costs (at around 10 to 30 per cent of United States levels).

The pool of available, suitably qualified personnel has declined in India and is relatively small in other potential economies for off-shore exports, namely China, Russia, parts of the former Soviet Union, etc. As a result, wages are rising which will increase the pool of available labour in the short-term by attracting existing qualified labour into Off-shoring activities and, in the longer term, by giving incentives for the young to gain the technical (degrees) and language skills necessary for Off-shoring activities.

However, there are medium term limits to supply expansion. No matter what the size of the potential labour force, it takes time to accumulate the skills, experience and expertise for Off-shoring export activity. This is why no matter what the technical potential for Off-shoring, its rate of increase from here on will be a function of the rate of growth of the suitable labour force in foreign jurisdictions. The reality is, however, that policies to enhance competitiveness in Off-shoring are now a major focus of policy across most suitable emerging economies, including, of course, China. It is over the longer term therefore, that is over the next one to two decades, that the full impact of Off-shoring will be realised.

In this context Off-shoring has just begun. For India, the most successful economy thus far in Off-shoring exports, the number currently employed in this activity is still only now approaching 1.5 million in information technology and business-process outsourcing.

On the demand side, the number of potential employment positions that can be off-shored will depend on the rate of technological change. The change to this point in time has allowed data processing and information technology employment positions to be off-shored. Many person to person occupations and higher management functions at this stage cannot be placed off-shore. However, as communications technology advances, the movement towards the virtual office will enable higher skilled management, co-ordination and research functions to be shifted off-shore, while an increasing number of health and education services also being able to be provided off-shore. Over the longer term, technological change will ensure the potential demand for off-shore activity will move in lock step with the growth of supply.

1.3 The macroeconomic dynamics of Off-shoring

In the first instance Off-shoring involves employment losses as employment is shifted to foreign jurisdictions, either by industry import penetration or by the transfer of some employment in established firms, that is, occupation import replacement. The question is whether, over the medium to longer terms, Off-shoring results in:

(i) net employment losses;

(ii) adverse impact on the distribution of income; and

(iii) loss in living standards compared to what would otherwise have been the case.

1.3.1 Net employment losses

The incentive for Off-shoring is cost savings. Hence, by definition cost savings will be an offset to Off-shoring employment losses provided enterprises which are the beneficiaries for Off-shoring pass on the lower costs in the form of lower prices. This will lower the cost level of the economy and thereby:

- increase consumption and investment expenditures via the increase in real incomes; and
- increase exports and reduce imports via the improvement in competitiveness of the economy resulting from the lower domestic costs relative to foreign competition.

There will be other benefits. In Diana Farrell (ed.) "*Off-shoring: Understanding the Emerging Global Labour Market*", Harvard Business School Press, Boston, Massachusetts, 2006, indicated the following macroeconomic benefits:

- cost savings (listing real incomes and competition as noted above);
- direct export enhancement as real incomes are increased in the economy benefiting from Off-shoring (e.g. India), increasing the demand for goods and services from the economy where the employment is being transferred from;
- income transfers (that is, repatriated earnings) if the companies to which the employment is being transferred to are owned by residents of the country from which the employment is being transferred from; and
- labour released by Off-shoring obtaining employment in the same or other industries, thereby further increasing the economic benefits.

This study quantified the average benefits as follows. For every $1 of United States spending sent off-shore to India:

- $0.58 cost savings accrue to investors and consumers;
- $0.05 of increased imports into India from the United States;
- $0.04 of transfer of profits from enterprises in India sent back to the United States; and
- $0.45 to $0.47 of value from re-employment of labour realised by Off-shoring in the United States.

Net economic benefits to the United States is, therefore, between $0.12 and $0.14.

There are a number of adjustments which would have to be made for the Australian context. Firstly, Australia's small share of Indian imports and lack of ownership of Indian off-shore service provider companies, would reduce the combined $0.09 benefit to negligible levels. Secondly, Australia's cost structure is lower than the United States, and recent movements in the Indian exchange rate and wage levels would have significantly reduced the net cost savings. The upper level benchmark adopted for this report is that once the current high level of world economic growth subsides and the Australian terms of trade and exchange rate return to more normal levels, the average level of direct cost savings from Off-shoring is set at 40 per cent, or 40 cents in the dollar.

1.3.2 The assumption of full employment

In some studies it is simply assumed that the employment boost from Off-shoring is automatically re-employed. This is clearly the case in the above study, where the $0.45 to $0.47 benefit from the re-employed labour is simply assumed to happen without any specific mechanism or mechanisms cited. The use of so-called CGE models to prove this is not evidence at all, since these models generally assume full employment irrespective of the shock to the economy.

The critical issue, therefore, determining the net benefits of Off-shoring is what happens to the realised labour. This, in turn, depends on whether or not the cost savings and other benefits are strong enough to result in the realised labour being re-employed. In general, not the same people as the displaced labour will not have the same skills and experience required for employment in industries stimulated by Off-shoring.

Some economists would argue that it does not matter whether or not the cost savings from Off-shoring are strong enough to offset employment losses from the direct impact of Off-shoring. This is because the economy will always gravitate to full employment and even if it does not the economy is now at full employment and the export of jobs would be of benefit as it would lower cost pressures in the economy.

This line of argument can be easily demolished. Firstly, the focus here is over the next two decades, not the here and now. Secondly, over the past 30 years only about 4 to 6 years have been ones where unemployment has been regarded as satisfactory. Booms have been followed by busts, where it has taken a decade or more for unemployment rates to return to previous peaks. What is concerning about the recent sustained reduction in unemployment rates is that it has been achieved by a near three-fold increase in the household debt to income ratio, with the household sector now approaching debt saturation levels. It is going to be much harder to maintain the employment generating capacity of the economy in the future compared to what has been the case in the past.

Thirdly, the current headline unemployment rates cannot be compared to the unemployment rates of two decades ago because;

- the shifting of persons from unemployment benefits to disability and other working age income support measures; and
- the increased flexibility of benefit recipients to work part-time, thereby allowing them to be counted as employed in the statistics,

has reduced the measured unemployment rate by between 3 and 4 percentage points compared to what would have been the case if the, say, 1990 circumstances had prevailed. That is, on a 1990 basis Australia's unemployment rate would be between 7 and 8 per cent (see ALGA/NIEIR "*State of the Regions Report*, 2007).

Further, Australia's employment to working age population rate is between 4 and 7 percentage points below some Western European economies and the ABS estimates that there are nearly two million Australians who would take an employment position if a suitable one was available.

Finally, it cannot be assumed that the recent high world economic growth rate will continue. Indeed, there are signs that it is now coming to an end, with the United States entering a period of low economic growth with inflationary pressures spreading this outcome to other countries. Therefore, the future is unlikely to differ from the past, where the majority of years could be characterised by years when the focus of attention will be on delivering employment opportunities, and a minority of years will be ones where the focus will be on constraining employment growth.

Therefore, this paper focuses on the critical issue of whether or not cost saving gains from Off-shoring is strong enough to generate offsetting employment opportunities. That is, whether or not there is likely to be medium to longer term net employment losses from the internal dynamics unleashed by Off-shoring.

Various interventions can be made to absorb the released labour. The last chapter of this study lists these interventions. The core issue, however, is whether or not the natural positive forms for employment creation arising from Off-shoring will be powerful enough to absorb the released labour.

1.3.3 Off-shoring and productivity enhancement

The direct benefits from Off-shoring arise in the same way as the benefits from technological change. That is, the domestic cost structure is reduced, which leads to higher real incomes, improved competitiveness, which in turn leads to higher levels of economic activity from increased exports and reduced imports, as has been noted above.

There will also be additional negatives from the direct loss in employment from Off-shoring. The loss in employment will reduce household incomes, government revenue, etc. and there will therefore be flow-on losses in consumption expenditure at least, and government expenditure if public sector borrowing constraints apply.

The condition for endogenous neutrality for the impact of Off-shoring on employment is that the positive productivity enhancement effect on employment equals the sum of the direct Off-shoring negative impact on the economy and the flow-on loss in employment from the initial loss in income from the direct Off-shoring employment loss to households and government. If neutrality is achieved, intervention is not required to neutralise the employment losses from Off-shoring.

Not unexpectedly, what the net employment losses from Off-shoring are, after the two flow-on effects are taken into account, namely:

(i) the income less flow-on effect; and

(ii) the productivity, or more accurately the cost reduction effect,

is an issue explicitly explored in this study.

1.3.4 The distribution of income

The impact on the distribution of income is another area of concern. Clearly, if there is a long-term net loss in employment then the distribution of income will change towards greater inequality, as those in employment experience real income gains while the percentage of those on low incomes will increase.

Even if there is no long run change in net employment levels from Off-shoring, there are suspicions that the distribution of income will change towards greater inequality. This could happen if the cost savings from Off-shoring are captured by those in employment who already had high incomes and the already wealthy who receive higher dividend payments and capital values for businesses. This could be compounded by the employment positions created being of lower average income compared to the employment positions destroyed by Off-shoring. For example, such as low income in personal service workers, which is one type of employment encouraged by trends towards increasing inequality.

1.3.5 Declines in standards of living

The issues here are specific and global. Clearly, from the above discussion, a segment of the population is likely to lose from Off-shoring on a long-term basis. Either from a change of status from full-time employment to a status of marginal commitment to the workforce (that is, periods of unemployment punctuated by periods of part-time, casual or limited duration employment), or the substitution of a higher paying employment for lower paying employment. This study examines whether or not the losers will outweigh the winners.

There may be a net fall in employment. However, this does not imply a decline in the standard of living as measured by GDP per capita. However:

- the less the cost benefits from Off-shoring are passed on in terms of lower prices or retained earnings, that is the more the cost savings from Off-shoring are passed on in terms of dividends and resultant profits;
- the less the net cost savings from Off-shoring; and

- the greater the level of foreign ownership in the economy,

then the greater the likelihood that there will be a global as well as specific decline in living standards.

The elephant in the room in regard to Off-shoring for Australia is the high foreign ownership of Australian enterprises which maximises the capacity to fully exploit the potential for Off-shoring.

1.4 The timeframe of the analysis

Clearly the further the horizon the greater will be the estimates of the direct employment losses from outsourcing. This is because the:

(i) closer the "virtual office" will be to a technological, economic and culturally acceptable reality; and

(ii) the greater the availability of well trained English speaking members to high skilled personnel will be available at a significant cost discount to the skill availability in Australia.

The timeframe of this analysis is linked to the realisation of the current potential for outsourcing as indicated by a statistical analysis of the Australian data. That is, the analysis is relatively short-term. How long it will take to realise this potential is uncertain. However, a timeframe of 15 to 20 years ahead would, in the circumstances, be reasonable. That is, the period of analysis is approximately to 2025, or the term used below "over the next one to two decades".

2. Off-shoring in the United States and Australia

The United States has been the jurisdiction that has had the longest and most intensive debate on Off-shoring. This is to be expected given the United States' leading role in driving the communications revolution and the fact that the United States has the highest cost differential from many occupational services that can now be sourced from foreign jurisdictions. That is, the cost differential between the domestic cost and the cost from a suitable foreign supplier, such as India.

2.1 United States' experience of Off-shoring service sector jobs

The most intense debate over the merits and extent of services Off-shoring has been in the United States where academic, industry and media debate reached a crescendo during the 2004 Presidential election campaign and has continued to prompt research relevant to this report. Interest in Off-shoring of service sector jobs exploded in February 2004 when N. Gregory Mankiw, the head of President Bush's Council of Economic Advisers, said told a press conference after releasing the *Economic Report of the President* that "outsourcing was just a new way of doing international trade" and that made it a "good thing"[2]. Democratic candidate John Kerry accused the Bush administration of wanting "to export more of our jobs overseas" and the Senate Minority Leader Tom Daschle said: "If this is the administration's position, I think they owe an apology to every worker in America."[3] Mankiw himself noted that "no economic issue generated more heat or shed less light than the debate over off-shore outsourcing"[4] In explaining his comment, Mankiw said in 2006: "…economists see outsourcing as simply a new form of international trade, which as usual creates winners and losers but involves gains to overall productivity and incomes."[5] But he concedes the issue has a political and social dimension which he felt in the 'political hysteria' that followed what he thought was 'a plain statement'. As well as more than 1,000 articles on the subject in the four major papers in the United States[6], the subject became part of popular culture including cartoons and jokes by late night television talk programs.

Having been 'in the eye of the storm', Mankiw's subsequent account of the issue with his former colleague from the Council of Economic Advisers, Phillip Swagel, provides a comprehensive overview of the origins of the US debate.[7] Interest in outsourcing had been rising in the US before 2004 with mentions in the four major newspapers increasing from an average of about 20 per month in 2002 and early 2003 to 50 per month at the end of 2003 and January 2004. The issue had been fermenting in a weak labour market that had been slow to recover from the economic slowdown of 2000 and 2001 (which included the loss of 1.3 million jobs in the six months after the September 11 terrorist attacks). Wages were also stagnating with real hourly earnings growing less than 1 per cent per year from 1999 to 2003. The US Bureau of Labor Statistics (BLS) survey of mass layoffs (layoffs of more than 50 persons in one facility) showed that in the first quarter of 2004, 10,722 jobs were lost due to Off-shoring or approximately 2.3 per cent of non-seasonal mass lay-offs[8]. These figures understate the actual situation as they only count mass layoffs of more than 50 workers in

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2 *The Outsourcing Bogeyman*, Daniel W Drezner, Foreign Affairs May/June 2004.

3 Ibid.

4 *The Politics and Economics of Off-shore Outsourcing*, N George Mankiw and Phillip Swagel, NBER Working Paper, National Bureau of Economic Research July 2006.

5 Ibid page 2.

6 The New York Times, Washington Post, Los Angeles Times, USA Today.

7 Ibid.

8 *The Implications of Service Off-shoring for Metropolitan Economies Appendix B,* Atkinson R. and Wial H., A Discussion Paper Prepared for The Brookings Institution Metropolitan Policy Program, February 2007.

establishments that employ more than 50 workers and companies may attribute mass layoffs to other reason such as losing a contract and not identify that the new contract will be fulfilled from off-shore.

In November 2002 Forrester Research published estimates of the number of US jobs that would be moved off-shore. In May 2004 Forrester Research revised its estimates upwards because, as analyst Stephanie Moore explained to the industry magazine Computerworld: "the political furore has increased awareness of off-shore outsourcing and increased awareness of the value of off-shore outsourcing." Forester's revised estimates were that 830,000 US jobs would be moved off-shore by the end of 2005 and that a total of 3.4 million additional US jobs would move overseas in the decade through to the end of 2015. Forrester expected the pace of Off-shoring to increase from about 200,000 to 300,000 jobs per year in 2010 to about 340,000 jobs per year in 2015. The estimated included 22 per cent of computer programming jobs being off-shored between 2000 and 2015[9]. Other contributions to the debate in the United States included the following.

- Goldman Sachs estimated that about 10,000 jobs per month had moved overseas in the three years before 2004 and that between 15,000 and 30,000 jobs would be off-shored going forward. In all, it estimated that up to 6 million jobs could be off-shored between 2003 and 2012.[10]
- In a May 2003 survey of Chief Information Officers 68 per cent of IT executives said that their off-shore contracts would grow in subsequent years. The Gartner research firm estimated that by the end of 2004, 1 out of every 10 IT jobs would be outsourced overseas. Deloitte Research predicted the outsourcing of 2 million US finance sector jobs by 2009[11].
- Tabulation of reports in Indian newspapers and journals for the month of July 2003 by Bardhan and Kroll[12] gave an estimate of 25,000 to 30,000 new outsourcing related jobs announced by US firms, In the same month there were 2,087 mass layoff actions by US employers resulting in a loss of 226,435 jobs. Jobs created in India included geographic information systems, stock market research, medical transcription, legal database research, data analysis, customer call centres, payroll and other back office services.
- IBM outsourced 3,000 jobs off-shore in 2004. One executive said: "Globalisation] means shifting a lot of jobs, opening a lot of locations in places we had never dreamt of before, going where there's low-cost labour, low-cost competition, shifting jobs off-shore". In testimony before Congress, then Hewett-Packard CEO Carly Fiorina warned "there is no job that is America's God-given right anymore." At the 2004 World Economic Forum Nandan Kilekani, CEO of Infosys Technologies, said: "Everything you can send down a wire is up for grabs."[13]
- Business Week reported in 2005 that the practise of global Business Process Outsourcing (BPO) has gone beyond call centres to such expertise-intensive functions as tax accounting, equity research, cash flow forecasting, fixed income asset pricing research, transaction processing, supply chain coordination and even R&D. Gartner expected worldwide business process outsourcing to reach $133.7 billion in 2005[14].

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[9] Ibid.

[10] Ibid and Mankiw and Swagel (2006).

[11] Drezner op cit.

[12] *The New Wave of Outsourcing*, Bardhan, A.D and Kroll, C.A.. Fisher Centre for Real Estate and Urban Economics, University of California, Berkeley, Fall 2003.

[13] Ibid.

[14] *Determinants of Operational Risk in Global Sourcing of Financial Services: Evidence from Field Research,* Aron, Ravi, Liu, Ying Brookings Trade Forum - 2005, pp. 373-398.

- Princeton economist Alan Blinder argued in 2006 that between 28 and 42 million service sector jobs could be off-shored. He said global trade in services would grow to include any service that can be delivered via an electronic interchange (voice, data, video). "In the future, and to a great extent already in the present, the key distinction for international trade will no longer be between things that can be put in a box and things that cannot [goods]. It will, instead, be between services that can be delivered electronically over long distances with little or no degradation of quality, and those that cannot.[15]"

- OECD Research in 2005 argued that close to 20 per cent of total employment in the EU15, the United States, Canada and Australia could potentially be affected by international sourcing of services activities. It found that service sectors such as financial and insurance services and computer and information services have the largest shares of employment potentially affected by Off-shoring[16].

In 2005, the United States Government Accountability Office (GAO) reported on the Off-shoring of services.[17] The report found that while 'traditional theory on international trade predicted that Off-shoring was likely to have a beneficial impact on the average US standard of living in the long run, some economists have argued it could harm US living standards. The report identified four areas of concern.

- Impacts on the average US standard of living (what sectors will emerge as new sources of competitive advantage and whether Off-shoring will contribute to downward pressure on US wages).

- Impacts on employment and job displacement (there are disagreements about predictions of projected job losses and the costs of displacement for those who lose their jobs).

- Impacts on the distribution of income (Off-shoring could increase income inequality by changing the distribution of income although there are disagreements about the characteristics of jobs that will be lost and created).

- Impacts on national security and consumer privacy (concerns have been raised about these issue but there are disagreements about the extent of risk and the extent to which existing laws and practices may mitigate risks).

Two key public policy issues emerge from the above discussion.

- The lack of comprehensive data on the employment impact of trade in services which is essential to informed debate on the subject. While data on mass layoffs is collected in the United States (albeit inadequate for reason outlined above) not such data is collected in Australia.

- The need for consistent and suitable methodology for projecting the potential for employment Off-shoring for nations, regions and occupations.

The objective of this study is to apply such a suitable methodology.

2.2 Off-shoring: The Australian context

Growth in the global trade for services in recent years implies a global integration of services supply chains following a similar pattern that has been established in merchandise or goods trade. This would imply the development of hubs or clusters that develop competitive

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[15] *Fear of Off-shoring*, Alan S Blinder, CEPS Working Paper No. 119, December 2005.

[16] *Potential Off-shoring of ICT-intensive using occupations*, Organisation for Economic Cooperation and Development, Working Party on the Information Economy April 2005.

[17] *Off-shoring of Services; An overview of the issues*, United States Government Accountability Office (GAO), Report to Congressional Committee, November 2005.

advantage in certain services or components of services. In Australia, this trend has been observed through developments in most service industries particularly in relation to back office services. These developments have attracted considerable public attention with a recent Research Paper by the Federal Parliamentary Library noting that 264 newspaper articles appeared on 'the loss of service based jobs to overseas markets'[18]. Banks have off-shored functions such as software development, call centres, superannuation and retirement services, account maintenance, document preparation, auditing, financial forecasting, debt collection and marketing. For local, state and federal government agencies, similar back office functions have been initially outsourced to commercial operators and integrated by these operators into global supply arrangements. In communications, local system development activities have been reduced with major providers increasingly looking for 'off-the-shelf' hardware solutions that bring with them their own maintenance arrangements often involving technicians who operate on a global or regional basis. Again, communication call centres (often marketing call centres) have been outsourced to global operators who seek out lowest cost options. In transport, repair operations, call centre operations, flight centre operations and in-flight attendants have all either been or are being considered as potential off-shore operations.

The following table, compiled for a policy paper prepared by service sector unions, illustrates the range of functions that have already been 'off-shored'.[19]

Table 2.1 'Off-shoring' – Service jobs gone

Company	Work area/State	Jobs performed 'off-shore'	Off-shore location	Info source	Date
AXA	IT and business processes	400	Bangalore	FSU Organisers	2005
ANZ	Software development/IT	1,100	Bangalore	SMH	November 2005
Coles Myer	Credit card processing	150	India	Parliamentary Library	March 2005
Citigroup	Call Centre – Brisbane	150	Manila		
Diners Club	Call Centre – Victoria	82	Manila	Correspondence	February 2005
Hewlett Packard	Call Centre support	128	Bangalore	Parliamentary Library	March 2005
Hutchison	Customer retention and business support	200	Mumbai	Parliamentary Library	March 2005
NAB	Accounts processing Credit cards/finance/IT	20 202	Bangalore	SMH The Age	May 2005 August 2006
Optus	Call Centre Operations	150	India	The Australian	November 2004
Telstra/EO#		400	India	The Age	October 2004
Telstra/IBM	IT	450	India	Parliamentary Library	March 2005
Qantas	Data processing/Flight attendants IT support & maintenance	500 340	India	Parliamentary Library Qantas	March 2005 October 2006
Telstra/EO#		180	India	Parliamentary Library	March 2005
St George	Collections & credit cards	96	India	The Australian	September 2006
Westpac//BT	Back office processing Retail administration	485 77	India India	SMH ABC	September 2006 September 2006
	Total so far …	**5,110**			

[18] *The statistical evidence for Off-shore outsourcing and its impact on the Australian labour force*, Research Paper, Parliamentary Library, Parliament of Australia, August 2007.

[19] Off-shoring; A joint policy paper by: Finance Sector Union; Australian Services Union; Communications, Electrical and Plumbing Union, Community and Public Sector Union, June 2006.

Business leaders in these industries increasingly see Off-shoring components of their operations as part of their strategic focus. New ANZ Chief Executive Officer, Mike Smith, said recently that 'technology and Off-shoring would be central to the bank's goal of doubling profits over the next five years'. "We will do more to further integrate and expand our operations in Bangalore … to reduce costs and foster innovation and improve services," he told an investor briefing before the banks Annual General Meeting.[20] He went on to say that this strategy would free up time for staff in Australia and New Zealand to focus on taking care of customers. In so doing he provided a very clear picture for the future of banking with technical and back office functions being globalised while customer facing and marketing activities were localised. A similar differentiation was offered by Westpac recently when criticised for Off-shoring credit card management and loan approval positions to an Indian company without consultation. A Westpac spokesman was quoted as saying Off-shoring was 'less about cutting costs and more about getting access to technology in back-office processing. "You can do things more quickly and that's more effective," he said.[21] The bank said it would keep 'direct customer contact roles in Australia'. Analysing the mid-year financial reports of the major banks, KPMG said it expected to see 'increased investment in off-shore back office functions to reduce costs' while focusing on 'improved customer service through increased branches and more frontline staff'.[22]

In telecommunications, Telstra recently signed a seven-year out-sourcing deal with IBM that is expected to deliver cost savings of as much as A$700 million. IBM is taking over end-to-end responsibility for the operation of Telstra's supply chain for telecommunications parts and common business consumables such as office products, utility services such as electricity, gas and water and industrial supplies. 'The deal is a further step towards Telstra chief executive Sol Trujillo's five-year game plan of reengineering Telstra's core business processes, and along the way cutting as many as 12,000 jobs. Cost savings are primarily driven by process simplification, system consolidation/replacement and headcount reductions. The approach to the deal is noteworthy not just for its scale, but also for the fact that both parties appear committed to the customization of structures, processes and people to fit IBM's core supply chain processes and software platforms - as opposed to customizing the systems to suit the client's preferred way of doing business. If IBM secures other telecoms clients into this model it will be interesting to observe the extent to which it can deploy its own globally integrated enterprise capabilities to the benefit of predominantly nationally bounded telecoms organisations. '[23]

The impact of these sorts of changes can be seen in Australia's trade figures. The largest increases in service imports between 2000 and 2007 have been in Computer and Information Services (100 per cent) and various business service imports such as 'Other' (300 per cent) and Miscellaneous business and professional services (50 per cent). (See Figure 2.1 below) While service imports in general increased by 45 per cent over the period (and imports of communication, insurance and finance services didn't change), imports of business services increased by 81 per cent between 2000 and 2007. At the same time the impact of outsourcing telecommunication systems development can be seen in Figure 2.2 below that illustrates the growth in imported telecommunications equipment and other electrical and office equipment.

As will be seen from the analysis below:

- Australia's services industries, particularly major components such as insurance, communication and financial services, are losing ground in international markets with a declining share of global exports;

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[20] *ANZ Bank ups the ante in India*, Australian IT, December 18 2007.

[21] *Westpac Jobs Bound for India*, Investor Daily, 17 September 2007.

[22] *Major Banks: Half Year 2006/07*, KPMG May 2007.

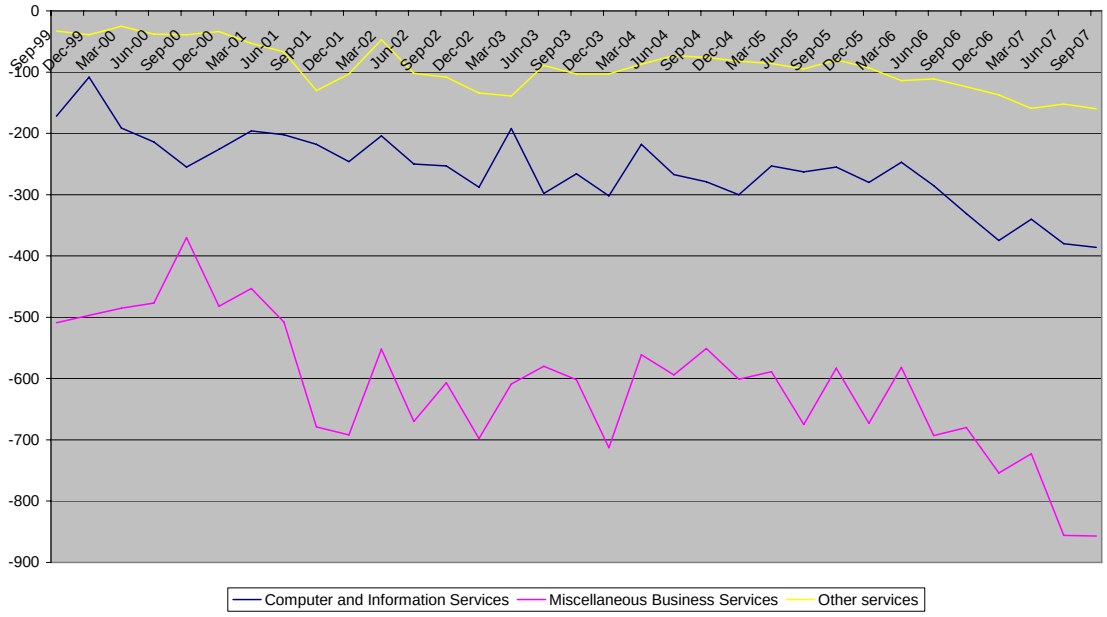
[23] *IBM/Telstra supply chain outsourcing deal,* Ovum Euroview, December 2007.

- significant components of Australia's service industries are being sent off-shore where other countries are developing specialist hubs leaving Australian workers as largely the marketers of 'products' but without involvement in the technical develop of products or the provision of back officer services;
- there is considerable anxiety in the community about the loss of service sector jobs given services employ more than one in four of the Australian workforce. It is important to know the potential scale and extent of job loss; and
- Off-shoring of service sector jobs will impact some occupations and skills more than others and potentially, some geographic areas more than others. It is important to understand the distributional impact of these changes.

These issues will be analysed further in this report and provide the basis of a discussion of policy options toward the end of the report.

Figure 2.1

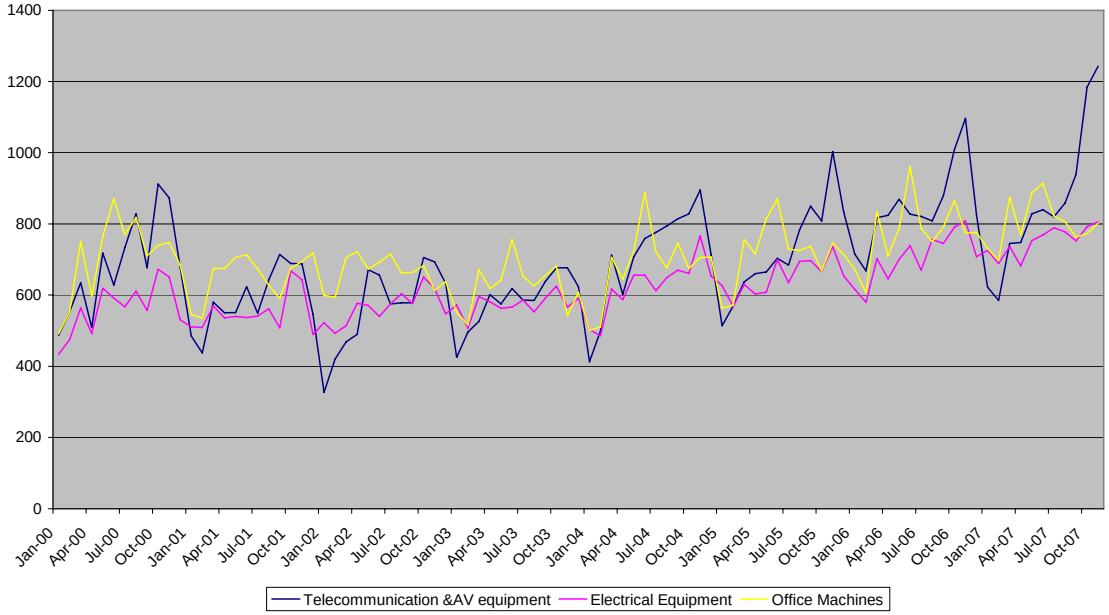
Imports of Selected Business Services 2000 - 07 ($Millions)



Source: **ABS 5368.0 Table 11b.**

Figure 2.2

Selected Merchandise Imports 2000 - 07 ($millions)



Source: **ABS 5439.0.**

3. Methodologies for evaluating the impact of services Off-shoring

The movement of jobs from high wage to low wage regions is not new. Starting in the 1970s (in Australia), that movement accelerated as many lower paid, moderate skilled manufacturing jobs moved to developing countries with lower wages. Prior to this, manufacturing essentially moved to where the markets were, established back office systems to support local operations and marketing and employed local people. But as manufacturing became more mobile in search of lower costs, back office programs also began to move – at first consolidated into service centres and then regionally generally within the same country. Today, digital electronic technologies permit information to be generated, routed and transmitted cheaply and almost instantaneously and in high volumes virtually anywhere in the world[24]. Costs of digital connectivity are also infinitely cheaper. A three minute telephone call between London and New York might have costs $70 in 1964 but today it would be less than 30 cents. The proliferation of standard software packages, new collaboration tools and computer enabled decision trees are all available to support remote workers.

These technological advances have also challenged traditional economic methodologies (and the statistical collection services that support their work) rapidly replacing old concepts focused on trade of goods. Increasingly the determinant of services that can be imported may not only be the cost of labour with many higher paying jobs of educated workers being off-shored. Equally the elements involved in 'trade' may not even be whole services or products but simply components of services. So in a rapidly changing market with relatively little experience and very limited data, the debate in the US has promoted a considerable debate about indicators for assessing the likely future impact of service sector globalisation.

Methodologies for assessing the impact of Off-shoring service sector jobs begin with the work of John McCarthy[25] whose predictions for Forrester Research contributed to the intense US debates of the 2004 Presidential campaign. McCarthy[26] classified service occupations according to their relative Off-shoring risk over the period 2000 to 2015. He placed occupations in five categories ranging from those with no risk of Off-shoring (eg. chief executives and cashiers) to those with the highest risk of Off-shoring (eg. computer programmers and data entry personnel). These classifications were based on McCarthy's assessment of whether a service is delivered locally, whether the necessary skills are available abroad, the role that technology plays in the business process and, whether the business process runs with well documented rules. Similar classification processes were used by Bardham and Kroll[27] who classified as 'at risk' occupation that do not require face to face contact with customers, have a high information content, can be performed remotely through telecommunications and the Internet, have lower wage costs, low set up costs and little or no social networking. Atkinson and Wial in their most recent contribution to the debate[28] have brought together many of the characteristics that make jobs more or less likely to be off-shored.

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[24] Atkinson and Wail 2007 op cit.

[25] *Near-Term Growth of Off-shoring Accelerating*, McCarthy, John C, Forrester Research, 2004.

[26] This description of McCarthy's methodology is derived from Atkinson and Wial (2007).

[27] Bardham and Kroll 2003 op cit.

[28] Atkinson and Wial 2007 op cit.

Seven Keys to Off-shoring

Types of service jobs more likely than others to be off-shored in the near future:

1. heavy reliance on information technology and routine or rule-based work;
2. lack of need for personal contact with customers;
3. wage cost savings in low-wage countries that outweigh productivity losses;
4. tradability;
5. availability of skills abroad;
6. labour intensiveness, ease of physical relocation and separability of jobs tasks from other parts of the production process; and
7. absence of cultural, institutional and legal barriers.

Adapted from: Atkinson and Wial, The Brookings Institute February 2007.

Most of the methodologies developed to understand Off-shoring involve a substantial element of estimation. For instance, to each of the five Off-shoring risk categories identified by McCarthy, he assigns a percentage of jobs present in 200 the he projected were likely to be off-shored by 2005 and 2015. Atkinson and Wial argue that projections such as these by management consultants are open to several criticisms. They may overstate the amount of future Off-shoring because some firms are in the business of advising firms on how to off-shore jobs. They rarely explain the basis of their projections so others can assess the work. Finally, 'consultants' estimates are based largely on their own judgement'. "Reliance on judgement," Atkinson and Wial argue, "is inevitable in projecting future Off-shoring."[29]

J Bradford Jensen and Lori Kletzer[30] developed a new empirical approach to identifying, at a detailed level, which service activities are vulnerable to international trade and Off-shoring. They start with the contention that "changes in technology will enable more activities to be traded internationally, What is unclear is how large these trends are likely to become, the sectors and occupations affected to date and going forward, and the impact on workers of the resulting dislocations. Without understanding the nature and scope of the changes, it is difficult to formulate effective public policy to address emerging needs."[31] The approach they adopt uses the geographic concentration of service activities in the US to identify which service activities are traded domestically. They then classify activities traded domestically as potentially tradeable internationally on the basis that a service being delivered remotely within a country could be delivered remotely internationally. Using identified industries and occupations they develop estimates of the number of workers who are in tradeable activities in all sectors in the economy. This enables them to compare the demographic characteristics of workers in tradable and non-tradable activities and the employment growth in traded and non-traded service activities. Based on this analysis they "find a significant

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[29] Ibid page 6.

[30] *Tradeable Services: Understanding the Scope and Impact of Service Outsourcing*, J Bradford Jensen and Lori G. Kietzer, Institute for International Economics Working Paper, September 2005.

[31] Ibid page 3.

number of service industries and occupations that appear tradable and substantial employment in those tradeable activities"[32]. Other observations include:

- that the number of workers potentially exposed to international trade in services is larger than the number of exposed workers in manufacturing;
- workers in tradable sectors have higher skills levels and significantly higher earnings;
- that employment in tradable activities grew more slowly in the period 1998 to 2002; and
- displacement rates may be higher from tradable than non-tradable service industries most notably the information sector and white collar occupations.

3.1 The methodology for estimating the potential for services Off-shoring adopted in this study

As noted above, Off-shoring has two dimensions, namely:

(i) the replacement of whole business units (firms, divisions, establishments) by imported services; and

(ii) the replacement of parts of components of business services provided by Australian employees (either in-house or out-sourced services) by services provided by foreign based employers that may involve a temporary stay in Australia.

In assessing (i) it is necessary to rank industries as to their potential for having their services displaced by impacts from owners. To access (ii) it is necessary to rate the potential for the services of individual occupations to be substituted for foreign based service providers vis-à-vis domestic based service providers.

3.1.1 Assessing the potential for service industry import substitution

The methodology adopted for the study has, as its foundation, the idea developed by J. Jensen and L. Kletzer "*Tradable Services: Understanding the Scope and Impact of Services Off-shoring*" in L. Brainard and J. Collins (eds) "*Off-shoring White-Collar Work – The Issues and Implications*", Brookings Trade Forum 2005.

The basic idea is as follows. Economic development within nations over the last century has been characterised by the concentration of those industries whose services are tradable across distance at a relatively small number of locations. These industries are the same industries which are likely to be at risk of being replaced by import substitution. That is, the shifting of the location of the service from within national locations to overseas locations.

The bottom line is that Off-shoring industry potential will be determined by national concentration outcomes, as concentration implies that an industry has a high capacity for trade in services.

The first step in developing Australian service industry out-sourcing scenarios is one of identifying industries with above average industry geographic concentration within the national economy.

3.1.2 The GINI coefficient: A measure of industry geographic concentration

The approach taken is to use the GINI coefficient for Australian service industries across 629 Australian Local Government Areas using NIEIR's "*YourPlace*" database of industry activity (employment, output, etc.) at the 4-digit ANZSIC industry classification level.

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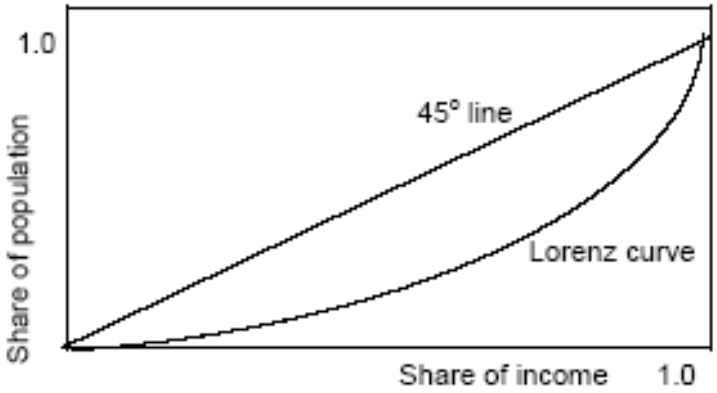
[32] Ibid page 1.

A GINI coefficient approach is used to measure the distribution of income or wealth. In relation to income, this is done by computing the share of income received by a given percentage of the population, as shown in Figure 3.1. The curve shown in Figure 3.1 is the Lorenz curve.

In terms of the Lorenz curve, a GINI coefficient is the ratio of the curve between the 45^o line and the curve over the whole area below the 45^o line. Thus, a GINI coefficient of zero would mean zero area between the 45^o line and the curve (that is, the curve is the 45^o line) and would imply perfect equality in the distribution of income. That is, everybody received the same absolute income per capita.

Figure 3.1: a Gini coefficient approach



A GINI coefficient of 1 would mean the curve would be the x axis and the right hand y axis, or perfect inequality as one person received all income.

In order to calculate the GINI coefficient for industry location, what is needed is the actual distribution of economic activity for a particular industry across locations (that is, the population equivalent) and the distribution of the demand for a particular industry's output based on the total economic environment of a particular location.

If the actual distribution of a particular industry's activity across locations was exactly the same as the distribution of the geographical demand for the industry's output, then the GINI coefficient would be 0 and it would indicate that the industry had no capacity to trade. If, on the other hand, the GINI coefficient was 1, then all the industry would be concentrated in one location and the industry would trade with all other regions.

3.1.3 Measuring the GINI coefficient of industry geographical concentration

The distribution of actual industry location is taken from the *YourPlace* database. The distribution of demand for an industry's output is approximated by the following.

$$IDS_{i,p} = \Sigma_j \, (Y_{t,j} / Y_i * InEMP_{j,p} / InEMP_j) \qquad (3.1)$$

Where:

$Y_{i,j}$	=	the output of industry *i* used by industry *j* (including government and private households as "industries");
Y_i	=	total output of industry *i*;
$InEMP_{j,p}$	=	industry *j* employment in region *p*;
$InEMP_j$	=	total employment in industry *j*.

Let,

$P_{i,p}$	=	region's share of total (national) employment in industry i.

Then the GINI coefficient will be given by:

$$\boldsymbol{G}_i = | 1 - \Sigma_p (\sigma S_{i,p-1} + \sigma S_{i,p}) * (\sigma IDS_{i,p-1} - \sigma IDS_{i,p}) | \quad (3.2)$$

Where σ denotes cumulative share after sorting the individual region's shares in ascending order, and:

$\boldsymbol{G}_i$ = GINI coefficient for industry *i.*

3.1.4 Methodology extension to occupations

The same concept applied to measure industry concentration can be applied to measure occupational concentration. That is, let:

$$ODS_{o,p} = \Sigma_j (IDS_{j,p} * OcEMP_{o,j}/OcEMP_o) \quad (3.3)$$

Where:

$IDS_{j,p}$ = industry demand share for industry *j* in region *p*;
$OcEMP_{o,j}$ = occupation *o* employment in industry *j*;
$OcEMP_o$ = total employment in occupation *o*.

That is, a GINI coefficient can be estimated for occupations. The higher the GINI coefficient for an occupation, the more likely it can be substituted by imported services provided by that occupation.

As explained below, the estimated GINI coefficient is used directly in determining the upper limit for Off-shoring for both industry import penetration and occupational relocation to foreign jurisdictions. As uncertainty exists over the exact link between the GINI coefficient and Off-shoring, three scenarios are developed around the link between the GINI coefficient and Off-shoring. The scenarios are the standard base, high and low scenarios.

4. GINI coefficient for Australian industry and occupations

As noted in the previous section, there are two types of Off-shoring, namely industry and occupations. Hence, the requirement is to calculate two types of GINI coefficients, namely one set for industry and one set for occupations.

The calculated GINI coefficients for 4-digit ANZSIC industries for Australia are shown in Table 4.1, while the GINI coefficients for 4-digit ASCO occupations are shown in Table 4.2.

The data for the calculation of the GINI coefficients is taken from NIEIR's *YourPlace* database across 628 Australian Local Government Areas (LGAs).

4.1 The tradable service sector thresholds

The recommendation from the Jansen and Kietzer study was a 0.1 threshold for a GINI coefficient. That is, for an estimated GINI coefficient for an industry or occupation below 0.1 the industry or occupation has a high degree of natural protection and, therefore, the industry or occupation is not likely to be significantly affected by Off-shoring.

4.2 The GINI coefficients cannot be applied without selected adjustment

Both Tables 4.1 and 4.2 have two columns, one for the estimated value taken from the GINI results across all 628 LGAs and the adjusted value adopted for this study.

In terms of the industry GINI adjustments given in the table, it shows clearly that the approach cannot be applied blindly. That is, that the GINI coefficients be accepted without question.

The reason for this is as follows. As noted above, the theory behind the GINI calculation is that if an industry is concentrated then, prima facie, it is evidence that the industry will be subject to Off-shoring as a result of communication technological change. However, in some cases the prima facie case will not be credible. This is because regional concentration does not mean that the service can be removed off-shore.

A case where this is the case is Central and State Governments. As shown in the table, they produce a higher GINI coefficient, that is, 0.28 and 0.2 respectively, as would be expected given their regional concentration. However, no-one would seriously accept that a significant part of the Central and State Government industry can be significantly replaced by imports of services from a foreign country. Hence, as shown in the table, the GINI coefficients for these two industries are set to zero. However, as will be seen below, this does not mean that some occupations employed by the Central and State Government service industry cannot exist off-shore.

Courier services are another case in point. Courier services are geographically concentrated as the GINI coefficient of 0.22 indicates. However, this industry is concentrated because it is not economic to offer the service in regions where there is low population densities. It would not be possible to offer courier services from a foreign jurisdiction. Hence, the GINI coefficient for this industry is set to zero.

The Government-Council cases apply to a number of other industries. For example, milk vending, department stores, international sea transport, other freight services.

Most transport services also require setting of the GINI coefficient at zero. This is because the service is provided on-site where goods are actually located during their passage in the supply change. This does not apply to the services to transport industry, which plays a

coordinating role that could be carried out from any jurisdiction provided the communication and skilled labour support base is in place.

The banking and finance sectors have high GINI coefficients and, in theory, with modern communications technologies could be provided from any jurisdiction. However, institutional, legal and intangible (confidence) constraints such as perceptions of trustworthiness will protect these industries. However, the GINIs of these industries are not discounted to zero, but are discounted by 60 per cent to reflect that cost considerations will influence some customers to change from the local institution to the foreign based institution.

The same more limited discounting is applied to the wholesaling industry. In theory a good deal of wholesaling (connecting sellers and buyers) can be carried out from any jurisdiction. However, some wholesaling requires packaging and repackaging services and/or knowledge that is best obtained by proximity to either the buyers or sellers. Hence, the GINI coefficient for the wholesale industry is discounted by 50 per cent. Those wholesale activities involving repair services will be even less affected by Off-shoring.

In terms of the occupation coefficient adjustments given in Table 4.2, a number of the higher skilled management occupations GINI coefficients have been discounted heavily. The high GINI coefficients for these occupations probably result more form the concentration of industries which employs these functions rather than from the inherent flexibility of location of the occupation. Nevertheless, the movement towards the virtual office will enable many of these management functions to be off-shored. Hence, the GINI coefficient has not been discounted to zero.

For other more technical occupations the GINI coefficients have been discounted significantly because, at this stage at least, face to face communication with customers is likely to be important, for example accountants and lawyers. Whether or not this remains the case is another question. Nevertheless, for these occupations local knowledge and experience is also a requirement for an efficient service.

Finally, it should be noted that if a calculated GINI is discounted and the discounted value falls below the 0.1 threshold value, then the below 0.1 value is accepted.

Table 4.1 GINI coefficient: industries

	Industry calculated (if greater than 0.1)	GINI coefficient adjusted
Cotton Ginning	0.00	0.00
Shearing Services	0.41	0.41
Aerial Agricultural Services	0.67	0.67
Services to Agriculture, nec	0.00	0.00
Hunting & Trapping	0.12	0.12
Forestry	0.37	0.37
Logging	0.13	0.13
Services to Forestry	0.00	0.00
Rock Lobster Fishing	0.38	0.38
Prawn Fishing	0.44	0.44
Finfish Trawling	0.50	0.50
Squid Jigging	0.85	0.85
Line Fishing	0.66	0.66
Marine Fishing, nec	0.31	0.31
Aquaculture	0.25	0.25
Black Coal Mining	0.44	0.44
Brown Coal Mining	0.77	0.77
Oil & Gas Extraction	0.36	0.36

Table 4.1 GINI coefficient: industries	Industry calculated (if greater than 0.1)	GINI coefficient adjusted
Iron Ore Mining	0.57	0.57
Bauxite Mining	0.69	0.69
Copper Ore Mining	0.60	0.60
Gold Ore Mining	0.34	0.34
Mineral Sand Mining	0.36	0.36
Nickel Ore Mining	0.00	0.00
Silver-Lead-Zinc Ore Mining	0.53	0.53
Metal Ore Mining, nec	0.51	0.51
Gravel & Sand Quarrying	0.00	0.00
Constrctn Material Mining, nec	0.00	0.00
Mining, nec	0.46	0.46
Petroleum Exploration (Own Acc)	0.00	0.00
Petroleum Exploration Services	0.00	0.00
Mineral Exploration (Own Acc)	0.00	0.00
Mineral Exploration Services	0.00	0.00
Other Mining Services	0.00	0.00
Meat Processing	0.24	0.24
Poultry Processing	0.50	0.50
Bacon, Ham & Smallgood Mfg	0.48	0.48
Milk & Cream Processing	0.39	0.39
Ice Cream Manufacturing	0.58	0.58
Dairy Product Manufacturing,	0.50	0.50
Fruit & Vegetable Processing	0.35	0.35
Oil & Fat Manufacturing	0.36	0.36
Flour Mill Product Manufacturing	0.60	0.60
Cereal Food & Baking Mix Mfg	0.51	0.51
Bread Manufacturing	0.20	0.20
Cake & Pastry Manufacturing	0.30	0.30
Biscuit Manufacturing	0.60	0.60

Table 4.1 GINI coefficient: industries (continued)	Industry calculated (if greater than 0.1)	GINI coefficient adjusted
Sugar Manufacturing	0.60	0.60
Confectionery Manufacturing	0.56	0.56
Seafood Processing	0.36	0.36
Prepared Animal & Bird Feed Mfg	0.60	0.60
Food Manufacturing, nec	0.31	0.31
Soft Drink, Cordial & Syrup Mfg	0.39	0.39
Beer & Malt Manufacturing	0.16	0.16
Wine Manufacturing	0.36	0.36
Spirit Manufacturing	0.53	0.53
Tobacco Product Manufacturing	0.00	0.00
Wool Scouring	0.62	0.62
Synthetic Fibre Textile Mfg	0.42	0.42
Cotton Textile Manufacturing	0.33	0.33
Wool Textile Manufacturing	0.67	0.67

Table 4.1 GINI coefficient: industries (continued)

	Industry calculated (if greater than 0.1)	GINI coefficient adjusted
Textile Finishing	0.32	0.32
Made-Up Textile Product Mfg	0.18	0.18
Textile Floor Covering Mfg	0.57	0.57
Rope, Cordage & Twine Mfg	0.60	0.60
Textile Product Mfg, nec	0.33	0.33
Hosiery Manufacturing	0.67	0.67
Cardigan & Pullover Mfg	0.55	0.55
Knitting Mill Prod Mfg, nec	0.43	0.43
Men's & Boys' Wear Mfg	0.34	0.34
Women's & Girls' Wear Mfg	0.20	0.20
Sleepwr Undwr & Infant Clthg	0.47	0.47
Clothing Manufacturing, nec	0.28	0.28
Footwear Manufacturing	0.48	0.48
Leather Tanning & Fur Dressing	0.20	0.20
Leather & Lthr Substit Prod Mfg	0.00	0.00
Log Sawmilling	0.10	0.10
Wood Chipping	0.40	0.40
Timber Resawing & Dressing	0.42	0.42
Plywood & Veneer Manufacturing	0.71	0.71
Fabricated Wood Manufacturing	0.54	0.54
Wooden Structural Component Mfg	0.16	0.16
Wood Product Manufacturing, nec	0.00	0.00
Pulp, Paper & Paperboard Mfg	0.19	0.19
Solid Paperboard Container Mfg	0.71	0.71
Corrugated Paperbrd Container Mfg	0.00	0.00
Paper Bag & Sack Manufacturing	0.70	0.70
Paper Product Manufacturing,	0.52	0.52
Paper Stationery Manufacturing	0.24	0.24
Printing	0.17	0.17
Services to Printing	0.00	0.00
Newspaper Printing or Publishing	0.19	0.19
Other Periodical Publishing	0.45	0.45
Book & Other Publishing	0.26	0.26
Recorded Media Mfg & Publishing	0.26	0.26
Petroleum Refining	0.35	0.35
Petroleum, Coal Product Mfg,	0.00	0.00
Fertiliser Manufacturing	0.69	0.69
Industrial Gas Manufacturing	0.00	0.00
Synthetic Resin Manufacturing	0.32	0.32
Organic Indust Chemical Mfg nec	0.48	0.48
Inorganic Industl Cheml Mfg nec	0.32	0.32
Explosive Manufacturing	0.33	0.33
Paint Manufacturing	0.39	0.39
Medicinal, Pharmactl Prodt Mfg	0.46	0.46
Pesticide Manufacturing	0.67	0.67
Soap & Other Detergent Mfg	0.37	0.37
Cosmetic, Toiletry Prep Mfg	0.55	0.55
Ink Manufacturing	0.48	0.48
Chemical Product Mfg, nec	0.31	0.31
Rubber Tyre Manufacturing	0.52	0.52
Rubber Product Mfg, nec	0.25	0.25
Plastic Blow Moulded Product	0.48	0.48
Plastic Extruded Prdct Mfg	0.49	0.49

Table 4.1 GINI coefficient: industries (continued)

	Industry calculated (if greater than 0.1)	GINI coefficient adjusted
Plastic Bag & Film Manufacturing	0.49	0.49
Plastc Prd Rigd Fbr Reinfrcd	0.27	0.27
Plastic Foam Product Mfg	0.38	0.38
Plastic Injctn Moulded Prod Mfg	0.29	0.29
Glass, Glass Product Mfg	0.24	0.24
Clay Brick Manufacturing	0.50	0.50
Ceramic Product Manufacturing	0.49	0.49
Ceramic Tile & Pipe Mfg	0.55	0.55
Ceramic Product Mfg, nec	0.26	0.26
Cement & Lime Manufacturing	0.45	0.45
Plaster Product Manufacturing	0.46	0.46
Concrete Slurry Manufacturing	0.12	0.12
Concrete Pipe, Box Culvert Mfg	0.59	0.59
Concrete Product Mfg, nec	0.24	0.24
Non-Metallic Minl Prod Mfg, nec	0.22	0.22
Basic Iron & Steel Mfg	0.22	0.22
Iron, Steel Casting, Forging	0.32	0.32
Steel Pipe, Tube Manufacturing	0.38	0.38
Alumina Production	0.57	0.57
Aluminium Smelting	0.41	0.41
Copr Slvr Lead Zinc Smltg Refng	0.42	0.42
Basic Non-Ferrous Metal Mfg, nec	0.00	0.00
Aluminium Rllng, Drwng, Extrudng	0.46	0.46
Non-Frs Mtl Rlng Drw Extrdng	1.00	1.00
Non-Ferrous Metal Casting	0.37	0.37
Structural Steel Fabricating	0.18	0.18
Architectural Aluminium Prod Mfg	0.27	0.27
Structural Metal Prod Mfg, nec	0.21	0.21
Metal Container Mfg	0.34	0.34
Sheet Metal Product Mfg, nec	0.00	0.00
Hand Tool, General Hardware Mfg	0.33	0.33
Spring & Wire Product Mfg	0.35	0.35
Nut, Bolt, Screw, Rivet Mfg	0.52	0.52
Metal Coating & Finishing	0.12	0.12
Non-Ferrous Pipe Fitting Mfg	0.68	0.68
Fabricated Metal Prods Mfg, nec	0.14	0.14
Motor Vehicle Manufacturing	0.25	0.25
Motor Vehicle Body Manufacturing	0.00	0.00
Automotive Elctrcl, Instrmnt Mfg	0.62	0.62
Automotive Component Mfg, nec	0.26	0.26
Shipbuilding	0.22	0.22
Boatbuilding	0.19	0.19
Railway Equipment Manufacturing	0.12	0.12
Aircraft Manufacturing	1.00	1.00
Transport Equipment Mfg, nec	0.35	0.35
Photographic, Optical Good Mfg	1.00	1.00
Medical, Surgical Equip Mfg	0.29	0.29
Profsnl, Scientific Equip Mfg nec	0.36	0.36
Computer, Business Machine Mfg	0.21	0.21
Telecmn Brdcstng Trnscvg Eqp	0.34	0.34
Electronic Equipment Mfg nec	0.18	0.18
Household Appliance Mfg	0.41	0.41
Electric Cable & Wire Mfg	0.52	0.52

Table 4.1 GINI coefficient: industries (continued)

	Industry calculated (if greater than 0.1)	GINI coefficient adjusted
Battery Manufacturing	0.54	0.54
Electric Light & Sign Mfg	0.35	0.35
Electrical Equipment Mfg nec	0.28	0.28
Agricultural Machinery Mfg	0.43	0.43
Mining, Constrtn Machinery Mfg	0.34	0.34
Food Processing Machinery Mfg	0.44	0.44
Machine Tool & Part Mfg	0.29	0.29
Lftng, Matral Handling Equip Mfg	0.25	0.25
Pump & Compressor Mfg	0.39	0.39
Comcl Spce Htng Colng Equip Mfg	0.61	0.61
Industl Machnry, Equip Mfg nec	0.19	0.19
Prefabricated Metal Building Mfg	0.00	0.00
Prefabricated Building Mfg, nec	0.19	0.19
Wdn Frntre, Upholstrd Seat Mfg	0.00	0.00
Sheet Metal Furniture Mfg	0.43	0.43
Mattress Mfg (Except Rubber)	0.50	0.50
Furniture Manufacturing, nec	0.00	0.00
Jewellery & Silverware Mfg	0.00	0.00
Toy & Sporting Good Mfg	0.00	0.00
Manufacturing, nec	0.20	0.20
Electricity Supply	0.25	0.25
Gas Supply	0.46	0.46
Water Supply	0.16	0.16
Sewerage & Drainage Services	0.23	0.23
House Construction	0.00	0.00
Residential Building Constrn	0.00	0.00
Non-Residential Building Constrn	0.24	0.24
Road & Bridge Construction	0.00	0.00
Non-Building Construction, nec	0.00	0.00
Site Preparation Services	0.00	0.00
Concreting Services	0.00	0.00
Bricklaying Services	0.00	0.00
Roofing Services	0.00	0.00
Structural Steel Erection Serv	0.00	0.00
Plumbing Services	0.00	0.00
Electrical Services	0.00	0.00
Air Conditioning, Heating Serv	0.00	0.00
Fire, Security System Services	0.00	0.00
Plastering & Ceiling Services	0.00	0.00
Carpentry Services	0.00	0.00
Tiling & Carpeting Services	0.00	0.00
Painting & Decorating Services	0.00	0.00
Glazing Services	0.00	0.00
Landscaping Services	0.00	0.00
Construction Services, nec	0.00	0.00
Wool Wholesaling	0.40	0.20
Cereal Grain Wholesaling	0.30	0.15
Farm Prod, Supp Wholesaling,	0.00	0.00
Petroleum Product Wholesaling	0.15	0.07
Metal & Mineral Wholesaling	0.22	0.11
Chemical Wholesaling	0.22	0.11
Timber Wholesaling	0.11	0.05
Building Supplies Whlsling, nec	0.15	0.07

Table 4.1 GINI coefficient: industries (continued)

	Industry calculated (if greater than 0.1)	GINI coefficient adjusted
Farm, Constrn Mach Wholesaling	0.00	0.00
Professional Equip Wholesaling	0.40	0.20
Computer Wholesaling	0.52	0.26
Business Mach Wholesaling, nec	0.35	0.17
Elctrl, Elctrc Equip Whlslng	0.31	0.15
Machinery, Equip Wholesaling	0.22	0.08
Car Wholesaling	0.32	0.11
Commercial Vehicle Wholesaling	0.40	0.14
Motor Vehicle New Part Dealing	0.15	0.05
Mtr Vhcl Dismntlng, Usd Prt Deal	0.23	0.08
Meat Wholesaling	0.11	0.06
Poultry, Smallgood Wholesaling	0.29	0.14
Dairy Produce Wholesaling	0.00	0.00
Fish Wholesaling	0.24	0.12
Fruit & Vegetable Wholesaling	0.26	0.13
Confectionery, Soft Drnk Whlslng	0.23	0.11
Liquor Wholesaling	0.28	0.14
Tobacco Product Wholesaling	0.61	0.30
Grocery Wholesaling, nec	0.15	0.07
Textile Product Wholesaling	0.41	0.20
Clothing Wholesaling	0.42	0.21
Footwear Wholesaling	0.45	0.23
Household Appliance Wholesaling	0.34	0.17
Furniture Wholesaling	0.30	0.15
Floor Covering Wholesaling	0.38	0.19
Household Good Wholesaling, nec	0.27	0.14
Photographic Equip Wholesaling	0.55	0.27
Jewellery & Watch Wholesaling	0.46	0.23
Toy, Sporting Good Wholesaling	0.34	0.17
Book & Magazine Wholesaling	0.37	0.18
Paper Product Wholesaling	0.32	0.16
Pharmaceutical, Toiletry Whlslng	0.41	0.20
Wholesaling, nec	0.19	0.09
Supermarket & Grocery Stores	0.00	0.00
Fresh Meat, Fsh, Pltry Retailing	0.00	0.00
Fruit & Vegetable Retailing	0.00	0.00
Liquor Retailing	0.00	0.00
Bread & Cake Retailing	0.00	0.00
Takeaway Food Retailing	0.00	0.00
Milk Vending	0.12	0.00
Specialised Food Retailing, nec	0.00	0.00
Department Stores	0.14	0.00
Clothing Retailing	0.00	0.00
Footwear Retailing	0.00	0.00
Fbrc, Other Soft Good Retailing	0.00	0.00
Furniture Retailing	0.00	0.00
Floor Covering Retailing	0.00	0.00
Domestic Hrdwre, Hware Retailing	0.00	0.00
Domestic Appliance Retailing	0.00	0.00
Recorded Music Retailing	0.16	0.16
Sport, Camp Equipment Retailing	0.00	0.00
Toy & Game Retailing	0.10	0.10
Newspaper Book Statnry Retailing	0.00	0.00

Table 4.1 GINI coefficient: industries (continued)

	Industry calculated (if greater than 0.1)	GINI coefficient adjusted
Photographic Equipment Retailing	0.28	0.28
Marine Equipment Retailing	0.23	0.23
Phrmceutcl, Cosmtc, Tltry Retlng	0.00	0.00
Antique & Used Good Retailing	0.00	0.00
Garden Equipment Retailing	0.00	0.00
Flower Retailing	0.00	0.00
Watch & Jewellery Retailing	0.10	0.10
Retailing, nec	0.00	0.00
Hhold Equip Repr Serv (Elctrcl)	0.00	0.00
Hhold Equip Repair Serv, nec	0.00	0.00
Car Retailing	0.00	0.00
Motor Cycle Dealing	0.00	0.00
Trailer & Caravan Dealing	0.31	0.00
Automotive Fuel Retailing	0.00	0.00
Automotive Electrical Services	0.00	0.00
Smash Repairing	0.00	0.00
Tyre Retailing	0.00	0.00
Automotive Repair Services, nec	0.00	0.00
Accommodation	0.00	0.00
Pubs, Taverns & Bars	0.00	0.00
Cafes & Restaurants	0.00	0.00
Clubs (Hospitality)	0.00	0.00
Road Freight Transport	0.00	0.00
Long Distance Bus Transport	0.00	0.00
Short Dist Bus Trns (Inc Tramwy)	0.00	0.00
Taxi, Other Road Passenger Trans	0.00	0.00
Rail Transport	0.00	0.00
International Sea Transport	0.32	0.00
Coastal Water Transport	0.00	0.00
Inland Water Transport	0.00	0.00
Scheduled International Air Trans	0.00	0.00
Scheduled Domestic Air Transport	0.00	0.00
Non-Scheduled Air, Space Trans	0.00	0.00
Pipeline Transport	0.00	0.00
Transport, nec	0.34	0.14
Parking Services	0.00	0.00
Services to Road Transport, nec	0.58	0.40
Stevedoring	0.00	0.00
Water Transport Terminals	0.00	0.00
Port Operators	0.00	0.00
Services to Water Transport,	0.00	0.00
Services to Air Transport	0.00	0.00
Travel Agency Services	0.00	0.00
Road Freight Forwarding	0.53	0.00
Freight Forwarding (Except Road)	0.64	0.00
Customs Agency Services	0.36	0.00
Services to Transport, nec	0.27	0.16
Grain Storage	0.22	0.00
Storage, nec	0.27	0.00
Postal Services	0.00	0.00
Courier Services	0.22	0.00
Telecommunication Services	0.37	0.37
Central Bank	0.83	0.00

Table 4.1 GINI coefficient: industries (continued)

	Industry calculated (if greater than 0.1)	GINI coefficient adjusted
Banks	0.33	0.13
Building Societies	0.25	0.10
Credit Unions	0.00	0.00
Money Market Dealers	0.70	0.28
Deposit Taking Financiers, nec	0.66	0.26
Other Financiers	0.57	0.23
Financial Asset Investors	0.00	0.00
Life Insurance	0.00	0.00
Superannuation Funds	0.00	0.00
Health Insurance	0.00	0.00
General Insurance	0.49	0.20
Financial Asset Broking Services	0.47	0.19
Services to Finance, Invest,	0.00	0.00
Services to Insurance	0.00	0.00
Residential Property Operators	0.00	0.00
Commrcl Prprty Oprtrs, Develprs	0.20	0.20
Real Estate Agents	0.00	0.00
Non-Financial Asset Investors	0.33	0.33
Motor Vehicle Hiring	0.14	0.14
Other Transport Equipment Leasing	0.15	0.15
Plant Hiring or Leasing	0.00	0.00
Scientific Research	0.23	0.23
Architectural Services	0.00	0.00
Surveying Services	0.00	0.00
Consulting Engineering Services	0.00	0.00
Technical Services, nec	0.00	0.00
Data Processing Services	0.59	0.59
Info Storage, Retrieval Serv	0.50	0.50
Computer Maintenance Services	0.00	0.00
Computer Consultancy Services	0.29	0.29
Legal Services	0.44	0.22
Accounting Services	0.21	0.21
Advertising Services	0.00	0.00
Commercial Art & Display Serv	0.21	0.00
Market Research Services	0.23	0.23
Business Administrative Services	0.00	0.00
Business Management Services	0.18	0.18
Employment Placement Services	0.22	0.22
Contract Staff Services	0.10	0.10
Secretarial Services	0.15	0.15
Scrty, Invest Serv (Ex Police)	0.00	0.00
Pest Control Services	0.00	0.00
Cleaning Services	0.00	0.00
Contract Packing Services, nec	0.40	0.00
Business Services, nec	0.13	0.13
Central Government Admin	0.28	0.00
State Government Administration	0.20	0.00
Local Government Administration	0.00	0.00
Justice	0.50	0.00
Foreign Government Representation	0.00	0.00
Defence	0.00	0.00
Preschool Education	0.00	0.00
Primary Education	0.00	0.00

Table 4.1 GINI coefficient: industries (continued)

	Industry calculated (if greater than 0.1)	GINI coefficient adjusted
Secondary Education	0.00	0.00
Combined Primary, Secondary Edcat	0.00	0.00
Special School Education	0.00	0.00
Higher Education	0.31	0.00
Technical & Further Education	0.00	0.00
Other Education	0.00	0.00
Hospitals (Ex Psychtrc Hospital)	0.00	0.00
Psychiatric Hospitals	0.00	0.00
Nursing Homes	0.00	0.00
General Practice Medical Srvcs	0.00	0.00
Specialist Medical Services	0.00	0.00
Dental Services	0.00	0.00
Pathology Services	0.00	0.00
Optometry & Optical Dispensing	0.00	0.00
Ambulance Services	0.00	0.00
Community Health Centres	0.00	0.00
Physiotherapy Services	0.00	0.00
Chiropractic Services	0.00	0.00
Health Services, nec	0.00	0.00
Veterinary Services	0.00	0.00
Child Care Services	0.00	0.00
Accommodation for the Aged	0.00	0.00
Residential Care Services, nec	0.00	0.00
Non-Residential Care Serv, nec	0.00	0.00
Film & Video Production	0.00	0.00
Film & Video Distribution	0.30	0.30
Motion Picture Exhibition	0.00	0.00
Radio Services	0.00	0.00
Television Services	0.00	0.00
Libraries	0.16	0.16
Museums	0.00	0.00
Zoological & Botanic Gardens	0.00	0.00
Recreational Parks & Gardens	0.00	0.00
Music & Theatre Productions	0.00	0.00
Creative Arts	0.00	0.00
Sound Recording Studios	0.00	0.00
Performing Arts Venues	0.00	0.00
Services to the Arts, nec	0.43	0.43
Horse & Dog Racing	0.00	0.00
Sports Grounds, Facilities, nec	0.00	0.00
Sports, Services to Sports, nec	0.00	0.00
Lotteries	0.00	0.00
Casinos	0.00	0.00
Gambling Services, nec	0.00	0.00
Other Recreation Services	0.11	0.11
Video Hire Outlets	0.00	0.00
Prsnl, Hhold Goods Hiring, nec	0.17	0.00
Laundries & Dry-Cleaners	0.00	0.00
Photographic Film Processing	0.00	0.00
Photographic Studios	0.00	0.00
Funerl Drts, Cremetria, Cemtries	0.00	0.00
Gardening Services	0.00	0.00
Hairdressing & Beauty Salons	0.00	0.00

Table 4.1 GINI coefficient: industries (continued)		
	Industry calculated (if greater than 0.1)	**GINI coefficient adjusted**
Personal Services, nec	0.00	0.00
Religious Organisations	0.00	0.00
Business & Professional Assoc	0.00	0.00
Labour Associations	0.00	0.00
Interest Groups, nec	0.00	0.00
Police Services	0.00	0.00
Corrective Centres	0.00	0.00
Fire Brigade Services	0.00	0.00
Waste Disposal Services	0.00	0.00

Table 4.2 GINI coefficient: occupations		
	Calculated (if greater than 0.1)	**Adjusted**
1111 Legislators and Government Appointed Officials	0.37	0.00
1112 General Managers	0.23	0.12
1191 Building and Construction Managers	0.00	0.00
1192 Importers, Exporters and Wholesalers	0.19	0.19
1193 Manufacturers	0.00	0.00
1211 Finance Managers	0.37	0.19
1212 Company Secretaries	0.24	0.12
1213 Human Resource Managers	0.37	0.18
1221 Engineering Managers	0.26	0.13
1222 Production Managers	0.14	0.07
1223 Supply and Distribution Managers	0.23	0.23
1224 Information Technology Managers	0.56	0.28
1231 Sales and Marketing Managers	0.31	0.19
1291 Policy and Planning Managers	0.67	0.20
1292 Health Services Managers	0.11	0.03
1293 Education Managers	0.00	0.00
1294 Commissioned Officers (Management)	0.00	0.00
1295 Child Care Co-ordinators	0.10	0.02
1296 Media Producers and Artistic Directors	0.56	0.22
1299 Other Specialist Managers	0.30	0.12
1311 Mixed Crop and Livestock Farmers	0.00	0.00
1312 Livestock Farmers	0.00	0.00
1313 Crop Farmers	0.00	0.00
1314 Aquaculture Farmers	0.21	0.00
2111 Chemists	0.34	0.34
2112 Geologists and Geophysicists	0.44	0.22
2113 Life Scientists	0.41	0.41
2114 Environmental and Agricultural Science Professionals	0.00	0.00
2115 Medical Scientists	0.58	0.23
2119 Other Natural and Physical Science Professionals	0.46	0.18
2121 Architects and Landscape Architects	0.51	0.20
2122 Quantity Surveyors	0.60	0.12
2123 Cartographers and Surveyors	0.16	0.11
2124 Civil Engineers	0.25	0.10

Table 4.2 GINI coefficient: occupations	Calculated (if greater than 0.1)	Adjusted
2125 Electrical and Electronics Engineers	0.37	0.11
2126 Mechanical, Production and Plant Engineers	0.29	0.09
2127 Mining and Materials Engineers	0.00	0.00
2128 Engineering Technologists	0.53	0.21
2129 Other Building and Engineering Professionals	0.31	0.12
2211 Accountants	0.37	0.15
2212 Auditors	0.62	0.00
2213 Corporate Treasurers	0.77	0.26
2221 Marketing and Advertising Professionals	0.43	0.17
2222 Technical Sales Representatives	0.35	0.17
2231 Computing Professionals	0.55	0.38
2291 Human Resource Professionals	0.37	0.11
2292 Librarians	0.29	0.04

Table 4.2 GINI coefficient: occupations (continued)	Calculated (if greater than 0.1)	Adjusted
2293 Mathematicians, Statisticians and Actuaries	0.00	0.00
2294 Business and Organisation Analysts	0.43	0.09
2295 Property Professionals	0.34	0.10
2299 Other Business and Information Professionals	0.56	0.56
2311 Generalist Medical Practitioners	0.14	0.01
2312 Specialist Medical Practitioners	0.38	0.08
2321 Nurse Managers	0.00	0.00
2322 Nurse Educators and Researchers	0.37	0.11
2323 Registered Nurses	0.13	0.03
2324 Registered Midwives	0.00	0.00
2325 Registered Mental Health Nurses	0.00	0.00
2326 Registered Developmental Disability Nurses	0.00	0.00
2381 Dental Practitioners	0.00	0.00
2382 Pharmacists	0.00	0.00
2383 Occupational Therapists	0.00	0.00
2384 Optometrists	0.00	0.00
2385 Physiotherapists	0.13	0.00
2386 Speech Pathologists	0.00	0.00
2387 Chiropractors and Osteopaths	0.00	0.00
2388 Podiatrists	0.14	0.00
2391 Medical Imaging Professionals	0.00	0.00
2392 Veterinarians	0.00	0.00
2393 Dietitians	0.24	0.02
2394 Natural Therapy Professionals	0.00	0.00
2399 Other Health Professionals	0.00	0.00
2411 Pre-Primary School Teachers	0.00	0.00
2412 Primary School Teachers	0.00	0.00
2413 Secondary School Teachers	0.00	0.00
2414 Special Education Teachers	0.00	0.00
2421 University Lecturers and Tutors	0.55	0.18
2422 Vocational Education Teachers	0.17	0.02
2491 Extra-Systemic Teachers	0.10	0.01

Table 4.2 GINI coefficient: occupations (continued)

	Calculated (if greater than 0.1)	Adjusted
2492 English as a Second Language Teachers	0.00	0.00
2493 Education Officers	0.27	0.03
2511 Social Workers	0.00	0.00
2512 Welfare and Community Workers	0.00	0.00
2513 Counsellors	0.14	0.03
2514 Psychologists	0.00	0.00
2515 Ministers of Religion	0.00	0.00
2521 Legal Professionals	0.63	0.13
2522 Economists	0.73	0.22
2523 Urban and Regional Planners	0.00	0.00
2529 Other Social Professionals	0.36	0.07
2531 Visual Arts and Crafts Professionals	0.00	0.00
2532 Photographers	0.23	0.01
2533 Designers and Illustrators	0.36	0.36
2534 Journalists and Related Professionals	0.43	0.22
2535 Authors and Related Professionals	0.33	0.33
2536 Film, Television, Radio and Stage Directors	0.46	0.05
2537 Musicians and Related Professionals	0.00	0.00
2538 Actors, Dancers and Related Professionals	0.37	0.22
2539 Media Presenters	0.00	0.00
2541 Air Transport Professionals	0.57	0.57
2542 Sea Transport Professionals	0.34	0.34
2543 Occupational and Environmental Health Professionals	0.15	0.15
2549 Other Professionals	0.14	0.14
3111 Medical Technical Officers	0.31	0.06
3112 Science Technical Officers	0.00	0.00
3121 Building, Architectural and Surveying Associate Professionals	0.20	0.10
3122 Civil Engineering Associate Professionals	0.21	0.10
3123 Electrical Engineering Associate Professionals	0.19	0.09
3124 Electronics Engineering Associate Professionals	0.30	0.15
3125 Mechanical Engineering Associate Professionals	0.26	0.13
3129 Other Building and Engineering Associate Professionals	0.21	0.10
3211 Branch Accountants and Managers (Financial Institution)	0.30	0.15
3212 Financial Dealers and Brokers	0.44	0.22
3213 Financial Investment Advisers	0.42	0.21
3291 Office Managers	0.12	0.04
3292 Project and Program Administrators	0.34	0.24
3293 Real Estate Associate Professionals	0.12	0.12
3294 Computing Support Technicians	0.47	0.47
3311 Shop Managers	0.00	0.00
3321 Restaurant and Catering Managers	0.11	0.11
3322 Chefs	0.17	0.00
3323 Hotel and Motel Managers	0.00	0.00
3324 Club Managers (Licensed Premises)	0.00	0.00
3325 Caravan Park and Camping Ground Managers	0.00	0.00
3329 Other Hospitality and Accommodation Managers	0.00	0.00
3391 Sport and Recreation Managers	0.00	0.00
3392 Customer Service Managers	0.26	0.13
3393 Transport Company Managers	0.00	0.00
3399 Other Managing Supervisors (Sales and Service)	0.00	0.00
3411 Enrolled Nurses	0.00	0.00
3421 Welfare Associate Professionals	0.00	0.00
3491 Ambulance Officers and Paramedics	0.00	0.00

Table 4.2 GINI coefficient: occupations (continued)		
	Calculated (if greater than 0.1)	Adjusted
3492 Dental Associate Professionals	0.00	0.00
3493 Aboriginal and Torres Strait Islander Health Workers	0.00	0.00
3494 Massage Therapists	0.00	0.00
3911 Police Officers	0.16	0.00
3991 Primary Products Inspectors	0.26	0.00
3992 Safety Inspectors	0.21	0.00
3993 Sportspersons, Coaches and Related Support Workers	0.13	0.13
3994 Senior Non-Commissioned Defence Force Officers	0.00	0.00
3995 Senior Fire Fighters	0.28	0.00
3996 Retail Buyers	0.35	0.18
3997 Library Technicians	0.18	0.09
3999 Other Miscellaneous Associate Professionals	0.00	0.00
4111 General Mechanical Engineering Tradespersons	0.00	0.00
4112 Metal Fitters and Machinists	0.00	0.00
4113 Toolmakers	0.44	0.44
4114 Aircraft Maintenance Engineers	0.00	0.00
4115 Precision Metal Tradespersons	0.12	0.12
4121 General Fabrication Engineering Tradespersons	0.00	0.00
4122 Structural Steel and Welding Tradespersons	0.00	0.00
4123 Forging Tradespersons	0.14	0.14
4124 Sheetmetal Tradespersons	0.28	0.28
4125 Metal Casting Tradespersons	0.51	0.51
4126 Metal Finishing Tradespersons	0.44	0.13
4211 Motor Mechanics	0.00	0.00
4212 Automotive Electricians	0.00	0.00
4213 Panel Beaters	0.00	0.00
4214 Vehicle Painters	0.11	0.11
4215 Vehicle Body Makers	0.46	0.14
4216 Vehicle Trimmers	0.16	0.16
4311 Electricians	0.00	0.00
4312 Refrigeration and Airconditioning Mechanics	0.16	0.16
4313 Electrical Distribution Tradespersons	0.00	0.00
4314 Electronic Instrument Tradespersons	0.00	0.00
4315 Electronic and Office Equipment Tradespersons	0.21	0.21
4316 Communications Tradespersons	0.00	0.00
4411 Carpentry and Joinery Tradespersons	0.00	0.00
4412 Fibrous Plasterers	0.00	0.00
4413 Roof Slaters and Tilers	0.19	0.19
4414 Bricklayers	0.00	0.00
4415 Solid Plasterers	0.00	0.00
4416 Wall and Floor Tilers and Stonemasons	0.10	0.10
4421 Painters and Decorators	0.00	0.00
4422 Signwriters	0.00	0.00
4423 Floor Finishers	0.00	0.00
4431 Plumbers	0.00	0.00
4511 Meat Tradespersons	0.00	0.00
4512 Bakers and Pastrycooks	0.00	0.00
4513 Cooks	0.00	0.00
4519 Other Food Tradespersons	0.48	0.48
4611 Farm Overseers	0.00	0.00
4612 Shearers	0.00	0.00
4613 Wool, Hide and Skin Classers	0.21	0.21
4614 Animal Trainers	0.13	0.13

Table 4.2 GINI coefficient: occupations (continued)		
	Calculated (if greater than 0.1)	Adjusted
4621 Nurserypersons	0.12	0.12
4622 Greenkeepers	0.00	0.00
4623 Gardeners	0.00	0.00
4911 Graphic Pre-Press Tradespersons	0.29	0.29
4912 Printing Machinists and Small Offset Printers	0.00	0.00
4913 Binders and Finishers	0.00	0.00
4914 Screen Printers	0.00	0.00
4921 Wood Machinists and Turners	0.24	0.24
4922 Cabinetmakers	0.00	0.00
4929 Other Wood Tradespersons	0.14	0.14
4931 Hairdressers	0.00	0.00
4941 Clothing Tradespersons	0.27	0.27
4942 Upholsterers and Bedding Tradespersons	0.00	0.00
4943 Footwear Tradespersons	0.00	0.00
4944 Leather Goods, Canvas Goods and Sail Makers	0.15	0.15
4981 Marine Construction Tradespersons	0.49	0.49
4982 Glass Tradespersons	0.11	0.11
4983 Jewellers and Related Tradespersons	0.28	0.14
4984 Florists	0.00	0.00
4985 Fire Fighters	0.22	0.22
4986 Drillers	0.18	0.18
4987 Chemical, Petroleum and Gas Plant Operators	0.00	0.00
4988 Power Generation Plant Operators	0.45	0.22
4991 Defence Force Members Not Elsewhere Included	0.65	0.00
4992 Performing Arts Support Workers	0.40	0.20
4999 Other Miscellaneous Tradespersons and Related Workers	0.11	0.11
5111 Secretaries and Personal Assistants	0.19	0.09
5911 Bookkeepers	0.00	0.00
5912 Credit and Loans Officers	0.41	0.16
5991 Advanced Legal and Related Clerks	0.44	0.18
5992 Court and Hansard Reporters	0.00	0.00
5993 Insurance Agents	0.45	0.23
5994 Insurance Risk Surveyors, Investigators and Loss Adjusters	0.00	0.00
5995 Desktop Publishing Operators	0.00	0.00
5996 Travel Attendants	0.00	0.00
5999 Other Miscellaneous Advanced Clerical and Service Workers	0.30	0.12
6111 General Clerks	0.17	0.17
6121 Keyboard Operators	0.29	0.29
6131 Receptionists	0.13	0.00
6141 Accounting Clerks	0.25	0.25
6142 Payroll Clerks	0.24	0.24
6143 Bank Workers	0.26	0.26
6144 Insurance Clerks	0.00	0.00
6145 Money Market and Statistical Clerks	0.00	0.00
6151 Production Recording Clerks	0.26	0.26
6152 Transport and Despatching Clerks	0.32	0.13
6153 Stock and Purchasing Clerks	0.20	0.20
6191 Inquiry and Admissions Clerks	0.39	0.04
6192 Library Assistants	0.00	0.00
6193 Personnel Clerks	0.37	0.07
6194 Intermediate Inspectors and Examiners	0.24	0.05
6199 Other Intermediate Clerical Workers	0.33	0.07
6211 Sales Representatives	0.23	0.05

Table 4.2 GINI coefficient: occupations (continued)

	Calculated (if greater than 0.1)	Adjusted
6212 Motor Vehicle and Related Products Salespersons	0.00	0.00
6213 Retail and Checkout Supervisors	0.00	0.00
6311 Education Aides	0.00	0.00
6312 Children's Care Workers	0.00	0.00
6313 Special Care Workers	0.00	0.00
6314 Personal Care and Nursing Assistants	0.00	0.00
6321 Hotel Service Supervisors	0.49	0.03
6322 Bar Attendants	0.00	0.00
6323 Waiters	0.17	0.00
6324 Hospitality Trainees	0.00	0.00
6391 Dental Assistants	0.10	0.00
6392 Veterinary Nurses	0.00	0.00
6393 Prison Officers	0.47	0.00
6394 Gaming Workers	0.74	0.22
6395 Personal Care Consultants	0.00	0.00
6396 Fitness Instructors and Related Workers	0.00	0.00
6397 Travel and Tourism Agents	0.30	0.21
6399 Other Intermediate Service Workers	0.00	0.00
7111 Mobile Construction Plant Operators	0.00	0.00
7112 Forklift Drivers	0.30	0.00
7119 Other Mobile Plant Operators	0.00	0.00
7121 Engine and Boiler Operators	0.17	0.00
7122 Crane, Hoist and Lift Operators	0.21	0.00
7123 Engineering Production Systems Workers	0.22	0.00
7124 Pulp and Paper Mill Operators	0.53	0.11
7129 Other Intermediate Stationary Plant Operators	0.00	0.00
7211 Sewing Machinists	0.28	0.03
7212 Textile and Footwear Production Machine Operators	0.40	0.04
7291 Plastics Production Machine Operators	0.42	0.04
7292 Rubber Production Machine Operators	0.47	0.05
7293 Chemical Production Machine Operators	0.49	0.05
7294 Wood Processing Machine Operators	0.00	0.00
7295 Paper Products Machine Operators	0.51	0.05
7296 Glass Production Machine Operators	0.00	0.00
7297 Clay, Stone and Concrete Processing Machine Operators	0.37	0.04
7298 Photographic Developers and Printers	0.20	0.02
7299 Other Intermediate Machine Operators	0.21	0.02
7311 Truck Drivers	0.00	0.00
7312 Bus and Tram Drivers	0.00	0.00
7313 Automobile Drivers	0.22	0.00
7314 Delivery Drivers	0.15	0.00
7315 Train Drivers and Assistants	0.40	0.00
7911 Miners	0.39	0.00
7912 Blasting Workers	0.39	0.00
7913 Structural Steel Construction Workers	0.22	0.00
7914 Insulation and Home Improvements Installers	0.13	0.00
7991 Motor Vehicle Parts and Accessories Fitters	0.00	0.00
7992 Product Quality Controllers	0.17	0.02
7993 Storepersons	0.16	0.00
7994 Seafarers and Fishing Hands	0.20	0.00
7995 Forestry and Logging Workers	0.00	0.00
7996 Printing Hands	0.37	0.00
8111 Registry and Filing Clerks	0.28	0.14

Table 4.2 GINI coefficient: occupations (continued)

	Calculated (if greater than 0.1)	Adjusted
8112 Mail Sorting Clerks	0.41	0.00
8113 Switchboard Operators	0.36	0.36
8114 Messengers	0.00	0.00
8115 Betting Clerks	0.00	0.00
8116 Office Trainees	0.21	0.21
8119 Other Elementary Clerks	0.13	0.13
8211 Sales Assistants	0.00	0.00
8291 Checkout Operators and Cashiers	0.00	0.00
8292 Ticket Salespersons	0.51	0.15
8293 Street Vendors and Related Workers	0.00	0.00
8294 Telemarketers	0.45	0.45
8295 Sales Demonstrators and Models	0.32	0.06
8296 Service Station Attendants	0.00	0.00
8297 Sales and Service Trainees	0.00	0.00
8299 Other Elementary Sales Workers	0.00	0.00
8311 Guards and Security Officers	0.28	0.00
8312 Ushers, Porters and Related Workers	0.36	0.00
8313 Domestic Housekeepers	0.16	0.00
8314 Caretakers	0.00	0.00
8315 Laundry Workers	0.00	0.00
8319 Other Elementary Service Workers	0.21	0.21
9111 Cleaners	0.00	0.00
9211 Engineering Production Process Workers	0.28	0.00
9212 Product Assemblers	0.36	0.00
9213 Meat and Fish Process Workers	0.20	0.00
9214 Other Food Factory Hands	0.19	0.00
9215 Wood Products Factory Hands	0.12	0.00
9219 Other Process Workers	0.22	0.00
9221 Hand Packers	0.12	0.00
9222 Packagers and Container Fillers	0.26	0.00
9911 Mining Support Workers and Driller's Assistants	0.27	0.00
9912 Earthmoving Labourers	0.00	0.00
9913 Paving and Surfacing Labourers	0.00	0.00
9914 Survey Hands	0.00	0.00
9915 Railway Labourers	0.20	0.00
9916 Construction and Plumber's Assistants	0.00	0.00
9917 Concreters	0.00	0.00
9918 Electrical and Telecommunications Trades Assistants	0.00	0.00
9919 Other Mining, Construction and Related Labourers	0.00	0.00
9921 Farm Hands	0.00	0.00
9922 Nursery and Garden Labourers	0.00	0.00
9929 Other Agricultural and Horticultural Labourers	0.00	0.00
9931 Kitchenhands	0.00	0.00
9932 Fast Food Cooks	0.00	0.00
9933 Food Trades Assistants	0.00	0.00
9991 Garbage Collectors	0.31	0.00
9992 Freight and Furniture Handlers	0.24	0.00
9993 Handypersons	0.00	0.00
9999 Other Miscellaneous Labourers and Related Workers	0.00	0.00

5. The link between the GINI coefficient and Off-shoring: Three scenarios for Australian industry

The next critical set is to specify the link between the adopted GINI coefficient value and Off-shoring. Because of the uncertainty surrounding this link, three scenarios are adopted, namely, base, high and low.

5.1 The base case scenario

For the base case for occupations, the direct proportionality assumption is adopted for the link between the GINI coefficient and Off-shoring potential, subject to a maximum value of 0.6. That is, a maximum percentage of employment being off-shored for a given industry or occupation being 60 per cent. That is:

$$of_i = 0.1 + (GINI_i - 0.1) \quad (5.1)$$

For $GINI_i \geq 0.1$, and if:

$$of_i > 0.6, of_i = 0.6 \quad (5.2)$$

Where:

of_i = potential percentage impact of Off-shoring on industry or occupation i;

$GINI_i$ = the adopted GINI coefficient for industry or occupation i.

For industry a less than direct proportional relationship is adopted because increases in Off-shoring penetration are likely to be more difficult for industry than occupation. For industry Off-shoring for the base case, the of_i will increase by only two thirds the increase in the GINI, whereas for occupations from equation (5.1) it is one to one.

5.2 The high and low scenarios

The high and low scenarios are simply derived by varying the influence of the change in the $GINI_i$ compared to the 0.1 threshold and the of_i estimate. For occupations for the low scenario the change in the of_i (relative to 0.1) is set at 0.66 of the change in the $GINI_i$, while for the high scenario it is set at 1.33.

For industry Off-shoring the coefficient applied to the change in the $GINI_i$ is set at 1.0, while for the low scenario it is set at 0.33.

It should be noted that the 0.6 maximum ceiling applies to all industries, occupations and scenarios.

5.3 Off-shoring: Gross employment losses by industry and occupations and by scenario

The estimates of the percentage and total number of employment positions that could profitably be off-shored via the industry mechanism, given the estimated of_i for each industry and scenario are given in Table 5.1. The overall percentages of service employment is 3.2 per cent for the base scenario, just under 4 per cent for the high scenario and 2.5 per cent for the low scenario. The gross numbers are 280,000 for the base scenario, 344,000 for the high scenario and 215,000 for the low scenario.

The results for occupational outsourcing mechanisms are given in Table 5.2. The range runs between potential employment losses from Off-shoring of 506,000 to 716,000.

The next step is to combine the results for the two mechanisms for outsourcing so that they can be additive. As it stands the results in Tables 5.1 and 5.2 have a degree of overlap in the estimates.

Table 5.1 Per cent of employment loss over next two decades from industry Off-shoring – 2006 employment levels

	Per cent of total industry employment		
Industry	**Base scenario**	**High scenario**	**Low scenario**
Wool Wholesaling	15.9	19.8	12.0
Cereal Grain Wholesaling	13.0	15.0	11.0
Farm Prod, Supp Wholesaling,	0.0	0.0	0.0
Petroleum Product Wholesaling	8.4	7.3	9.5
Metal & Mineral Wholesaling	10.6	11.1	10.2
Chemical Wholesaling	10.5	10.8	10.2
Timber Wholesaling	7.2	5.4	9.1
Building Supplies Whlsling, nec	8.4	7.3	9.5
Farm, Constrn Mach Wholesaling	0.0	0.0	0.0
Professional Equip Wholesaling	15.9	19.8	12.0
Computer Wholesaling	19.5	25.9	13.2
Business Mach Wholesaling, nec	14.5	17.5	11.5
Elctrl, Elctrc Equip Whlslng	13.3	15.4	11.1
Machinery, Equip Wholesaling	8.7	7.8	9.6
Car Wholesaling	10.7	11.2	10.2
Commercial Vehicle Wholesaling	12.5	14.1	10.8
Motor Vehicle New Part Dealing	7.1	5.1	9.0
Mtr Vhcl Dismntlng, Usd Prt Deal	8.9	8.1	9.6
Meat Wholesaling	7.4	5.6	9.1
Poultry, Smallgood Wholesaling	12.7	14.4	10.9
Dairy Produce Wholesaling	0.0	0.0	0.0
Fish Wholesaling	11.1	11.9	10.4
Fruit & Vegetable Wholesaling	11.7	12.8	10.6
Confectionery, Soft Drnk Whlslng	10.9	11.5	10.3
Liquor Wholesaling	12.3	13.8	10.8
Tobacco Product Wholesaling	22.2	30.4	14.1
Grocery Wholesaling, nec	8.4	7.4	9.5
Textile Product Wholesaling	16.2	20.3	12.1
Clothing Wholesaling	16.6	21.1	12.2
Footwear Wholesaling	17.6	22.7	12.5
Household Appliance Wholesaling	14.2	17.0	11.4
Furniture Wholesaling	13.0	15.0	11.0
Floor Covering Wholesaling	15.4	19.0	11.8
Household Good Wholesaling, nec	12.2	13.7	10.7
Photographic Equip Wholesaling	20.4	27.3	13.5
Jewellery & Watch Wholesaling	17.8	23.0	12.6
Toy, Sporting Good Wholesaling	14.3	17.2	11.4
Book & Magazine Wholesaling	15.1	18.4	11.7
Paper Product Wholesaling	13.6	16.1	11.2
Pharmaceutical, Toiletry Whlslng	16.2	20.4	12.1

Table 5.1 Per cent of employment loss over next two decades from industry Off-shoring – 2006 employment levels			
	Per cent of total industry employment		
Industry	Base scenario	High scenario	Low scenario
Wholesaling, nec	9.7	9.5	9.9

Table 5.1 Per cent of employment loss over next two decades from industry Off-shoring – 2006 employment levels (continued)			
	Per cent of total industry employment		
Industry	Base scenario	High scenario	Low scenario
Supermarket & Grocery Stores	0.0	0.0	0.0
Fresh Meat, Fsh, Pltry Retailing	0.0	0.0	0.0
Fruit & Vegetable Retailing	0.0	0.0	0.0
Liquor Retailing	0.0	0.0	0.0
Bread & Cake Retailing	0.0	0.0	0.0
Takeaway Food Retailing	0.0	0.0	0.0
Milk Vending	0.0	0.0	0.0
Specialised Food Retailing, nec	0.0	0.0	0.0
Department Stores	0.0	0.0	0.0
Clothing Retailing	0.0	0.0	0.0
Footwear Retailing	0.0	0.0	0.0
Fbrc, Other Soft Good Retailing	0.0	0.0	0.0
Furniture Retailing	0.0	0.0	0.0
Floor Covering Retailing	0.0	0.0	0.0
Domestic Hrdwre, Hware Retailing	0.0	0.0	0.0
Domestic Appliance Retailing	0.0	0.0	0.0
Recorded Music Retailing	13.5	15.8	11.2
Sport, Camp Equipment Retailing	0.0	0.0	0.0
Toy & Game Retailing	10.3	10.5	10.1
Newspaper Book Statnry Retailing	0.0	0.0	0.0
Photographic Equipment Retailing	21.0	28.3	13.7
Marine Equipment Retailing	18.1	23.4	12.7
Phrmceutcl, Cosmtc, Tltry Retlng	0.0	0.0	0.0
Antique & Used Good Retailing	0.0	0.0	0.0
Garden Equipment Retailing	0.0	0.0	0.0
Flower Retailing	0.0	0.0	0.0
Watch & Jewellery Retailing	10.1	10.1	10.0
Retailing, nec	0.0	0.0	0.0
Hhold Equip Repr Serv (Elctrcl)	0.0	0.0	0.0
Hhold Equip Repair Serv, nec	0.0	0.0	0.0
Car Retailing	0.0	0.0	0.0
Motor Cycle Dealing	0.0	0.0	0.0
Trailer & Caravan Dealing	0.0	0.0	0.0
Automotive Fuel Retailing	0.0	0.0	0.0
Automotive Electrical Services	0.0	0.0	0.0

Table 5.1 Per cent of employment loss over next two decades from industry Off-shoring – 2006 employment levels (continued)			
	Per cent of total industry employment		
Industry	Base scenario	High scenario	Low scenario
Smash Repairing	0.0	0.0	0.0
Tyre Retailing	0.0	0.0	0.0
Automotive Repair Services, nec	0.0	0.0	0.0
Accommodation	0.0	0.0	0.0
Pubs, Taverns & Bars	0.0	0.0	0.0
Cafes & Restaurants	0.0	0.0	0.0
Clubs (Hospitality)	0.0	0.0	0.0
Road Freight Transport	0.0	0.0	0.0
Long Distance Bus Transport	0.0	0.0	0.0
Short Dist Bus Trns (Inc Tramwy)	0.0	0.0	0.0
Taxi, Other Road Passenger Trans	0.0	0.0	0.0
Rail Transport	0.0	0.0	0.0
International Sea Transport	0.0	0.0	0.0
Coastal Water Transport	0.0	0.0	0.0
Inland Water Transport	0.0	0.0	0.0
Scheduled International Air Trans	0.0	0.0	0.0
Scheduled Domestic Air Transport	0.0	0.0	0.0
Non-Scheduled Air, Space Trans	0.0	0.0	0.0
Pipeline Transport	0.0	0.0	0.0
Transport, nec	12.2	13.7	10.7
Parking Services	0.0	0.0	0.0
Services to Road Transport, nec	28.2	40.4	16.1
Stevedoring	0.0	0.0	0.0
Water Transport Terminals	0.0	0.0	0.0
Port Operators	0.0	0.0	0.0
Services to Water Transport,	0.0	0.0	0.0
Services to Air Transport	0.0	0.0	0.0
Travel Agency Services	0.0	0.0	0.0
Road Freight Forwarding	0.0	0.0	0.0
Freight Forwarding (Except Road)	0.0	0.0	0.0
Customs Agency Services	0.0	0.0	0.0
Services to Transport, nec	13.9	16.5	11.3
Grain Storage	0.0	0.0	0.0
Storage, nec	0.0	0.0	0.0
Postal Services	0.0	0.0	0.0
Courier Services	0.0	0.0	0.0
Telecommunication Services	26.1	36.8	15.4
Central Bank	0.0	0.0	0.0
Banks	11.9	13.1	10.6
Building Societies	10.0	10.0	10.0
Credit Unions	0.0	0.0	0.0
Money Market Dealers	20.9	28.2	13.6
Deposit Taking Financiers, nec	19.7	26.2	13.2

Table 5.1 Per cent of employment loss over next two decades from industry Off-shoring – 2006 employment levels (continued)

Industry	Per cent of total industry employment		
	Base scenario	High scenario	Low scenario
Other Financiers	17.7	22.9	12.6
Financial Asset Investors	0.0	0.0	0.0
Life Insurance	0.0	0.0	0.0
Superannuation Funds	0.0	0.0	0.0
Health Insurance	0.0	0.0	0.0
General Insurance	15.8	19.7	11.9
Financial Asset Broking Services	15.2	18.6	11.7
Services to Finance, Invest,	0.0	0.0	0.0
Services to Insurance	0.0	0.0	0.0
Residential Property Operators	0.0	0.0	0.0
Commrcl Prprty Oprtrs, Develprs	16.0	20.0	12.0
Real Estate Agents	0.0	0.0	0.0
Non-Financial Asset Investors	23.8	33.0	14.6
Motor Vehicle Hiring	12.2	13.7	10.7
Other Transport Equipment Leasing	12.9	14.8	11.0
Plant Hiring or Leasing	0.0	0.0	0.0
Scientific Research	18.0	23.3	12.7
Architectural Services	0.0	0.0	0.0
Surveying Services	0.0	0.0	0.0
Consulting Engineering Services	0.0	0.0	0.0
Technical Services, nec	0.0	0.0	0.0
Data Processing Services	39.6	59.3	19.9
Info Storage, Retrieval Serv	33.8	49.6	17.9
Computer Maintenance Services	0.0	0.0	0.0
Computer Consultancy Services	21.3	28.9	13.8
Legal Services	17.3	22.2	12.4
Accounting Services	16.6	21.0	12.2
Advertising Services	0.0	0.0	0.0
Commercial Art & Display Serv	0.0	0.0	0.0
Market Research Services	17.8	23.0	12.6
Business Administrative Services	0.0	0.0	0.0
Business Management Services	14.9	18.2	11.6
Employment Placement Services	17.1	21.8	12.4
Contract Staff Services	10.0	10.0	10.0
Secretarial Services	13.2	15.3	11.1
Scrty, Invest Serv (Ex Police)	0.0	0.0	0.0
Pest Control Services	0.0	0.0	0.0
Cleaning Services	0.0	0.0	0.0
Contract Packing Services, nec	0.0	0.0	0.0
Business Services, nec	11.6	12.6	10.5
Central Government Admin	0.0	0.0	0.0
State Government Administration	0.0	0.0	0.0
Local Government Administration	0.0	0.0	0.0

Table 5.1 Per cent of employment loss over next two decades from industry Off-shoring – 2006 employment levels (continued)			
	Per cent of total industry employment		
Industry	Base scenario	High scenario	Low scenario
Justice	0.0	0.0	0.0
Foreign Government Representation	0.0	0.0	0.0
Defence	0.0	0.0	0.0
Preschool Education	0.0	0.0	0.0
Primary Education	0.0	0.0	0.0
Secondary Education	0.0	0.0	0.0
Combined Primary, Secondary Edcat	0.0	0.0	0.0
Special School Education	0.0	0.0	0.0
Higher Education	0.0	0.0	0.0
Technical & Further Education	0.0	0.0	0.0
Other Education	0.0	0.0	0.0
Hospitals (Ex Psychtrc Hospital)	0.0	0.0	0.0
Psychiatric Hospitals	0.0	0.0	0.0
Nursing Homes	0.0	0.0	0.0
General Practice Medical Srvcs	0.0	0.0	0.0
Specialist Medical Services	0.0	0.0	0.0
Dental Services	0.0	0.0	0.0
Pathology Services	0.0	0.0	0.0
Optometry & Optical Dispensing	0.0	0.0	0.0
Ambulance Services	0.0	0.0	0.0
Community Health Centres	0.0	0.0	0.0
Physiotherapy Services	0.0	0.0	0.0
Chiropractic Services	0.0	0.0	0.0
Health Services, nec	0.0	0.0	0.0
Veterinary Services	0.0	0.0	0.0
Child Care Services	0.0	0.0	0.0
Accommodation for the Aged	0.0	0.0	0.0
Residential Care Services, nec	0.0	0.0	0.0
Non-Residential Care Serv, nec	0.0	0.0	0.0
Film & Video Production	0.0	0.0	0.0
Film & Video Distribution	22.0	29.9	14.0
Motion Picture Exhibition	0.0	0.0	0.0
Radio Services	0.0	0.0	0.0
Television Services	0.0	0.0	0.0
Libraries	13.7	16.2	11.2
Museums	0.0	0.0	0.0
Zoological & Botanic Gardens	0.0	0.0	0.0
Recreational Parks & Gardens	0.0	0.0	0.0
Music & Theatre Productions	0.0	0.0	0.0
Creative Arts	0.0	0.0	0.0
Sound Recording Studios	0.0	0.0	0.0
Performing Arts Venues	0.0	0.0	0.0
Services to the Arts, nec	29.7	42.8	16.6

Table 5.1 Per cent of employment loss over next two decades from industry Off-shoring – 2006 employment levels (continued)			
	Per cent of total industry employment		
Industry	**Base scenario**	**High scenario**	**Low scenario**
Horse & Dog Racing	0.0	0.0	0.0
Sports Grounds, Facilities, nec	0.0	0.0	0.0
Sports, Services to Sports, nec	0.0	0.0	0.0
Lotteries	0.0	0.0	0.0
Casinos	0.0	0.0	0.0
Gambling Services, nec	0.0	0.0	0.0
Other Recreation Services	10.6	11.1	10.2
Video Hire Outlets	0.0	0.0	0.0
Prsnl, Hhold Goods Hiring, nec	0.0	0.0	0.0
Laundries & Dry-Cleaners	0.0	0.0	0.0
Photographic Film Processing	0.0	0.0	0.0
Photographic Studios	0.0	0.0	0.0
Funerl Drts, Cremetria, Cemtries	0.0	0.0	0.0
Gardening Services	0.0	0.0	0.0
Hairdressing & Beauty Salons	0.0	0.0	0.0
Personal Services, nec	0.0	0.0	0.0
Religious Organisations	0.0	0.0	0.0
Business & Professional Assoc	0.0	0.0	0.0
Labour Associations	0.0	0.0	0.0
Interest Groups, nec	0.0	0.0	0.0
Police Services	0.0	0.0	0.0
Corrective Centres	0.0	0.0	0.0
Fire Brigade Services	0.0	0.0	0.0
Waste Disposal Services	0.0	0.0	0.0
Total (per cent of service sector employment)	**3.2**	**3.9**	**2.5**
Total (2006 number)	**279706.9**	**344069.1**	**215344.8**

Table 5.2 Per cent of service industry occupations from Off-shoring over next two decades – occupations Off-shoring methodology			
	Per cent of total employment		
Occupations	Base scenario	High scenario	Low scenario
1111 Legislators and Government Appointed Officials	0.0	0.0	0.0
1112 General Managers	9.1	9.6	8.5
1191 Building and Construction Managers	0.0	0.0	0.0
1192 Importers, Exporters and Wholesalers	18.5	22.0	15.1
1193 Manufacturers	0.0	0.0	0.0
1211 Finance Managers	15.8	18.8	12.9
1212 Company Secretaries	8.4	9.0	7.9
1213 Human Resource Managers	15.9	18.8	13.0
1221 Engineering Managers	6.5	7.1	5.9
1222 Production Managers	1.4	1.2	1.6
1223 Supply and Distribution Managers	18.5	22.7	14.3
1224 Information Technology Managers	25.9	32.6	19.2
1231 Sales and Marketing Managers	15.6	18.6	12.7
1291 Policy and Planning Managers	19.6	23.5	15.6
1292 Health Services Managers	3.3	3.9	2.6
1293 Education Managers	0.0	0.0	0.0
1294 Commissioned Officers (Management)	0.0	0.0	0.0
1295 Child Care Co-ordinators	2.0	2.4	1.6
1296 Media Producers and Artistic Directors	20.3	24.8	15.8
1299 Other Specialist Managers	10.0	10.6	9.4
1311 Mixed Crop and Livestock Farmers	0.0	0.0	0.0
1312 Livestock Farmers	0.0	0.0	0.0
1313 Crop Farmers	0.0	0.0	0.0
1314 Aquaculture Farmers	0.0	0.0	0.0
2111 Chemists	15.9	20.4	11.4
2112 Geologists and Geophysicists	11.3	13.8	8.9
2113 Life Scientists	41.5	54.0	28.9
2114 Environmental and Agricultural Science Professionals	0.0	0.0	0.0
2115 Medical Scientists	23.2	28.4	17.9
2119 Other Natural and Physical Science Professionals	14.1	16.7	11.6
2121 Architects and Landscape Architects	16.7	20.1	13.3
2122 Quantity Surveyors	9.4	10.1	8.8
2123 Cartographers and Surveyors	8.6	8.9	8.3
2124 Civil Engineers	7.6	7.6	7.6
2125 Electrical and Electronics Engineers	7.1	7.4	6.9
2126 Mechanical, Production and Plant Engineers	3.2	3.0	3.4
2127 Mining and Materials Engineers	0.0	0.0	0.0
2128 Engineering Technologists	11.9	14.4	9.4
2129 Other Building and Engineering Professionals	7.1	7.6	6.5
2211 Accountants	13.0	14.6	11.3
2212 Auditors	0.0	0.0	0.0
2213 Corporate Treasurers	23.0	28.6	17.3

Table 5.2 Per cent of service industry occupations from Off-shoring over next two decades – occupations Off-shoring methodology (continued)

Occupations	Per cent of total employment		
	Base scenario	High scenario	Low scenario
2221 Marketing and Advertising Professionals	15.3	17.9	12.8
2222 Technical Sales Representatives	15.1	17.7	12.6
2231 Computing Professionals	36.2	46.9	25.5
2291 Human Resource Professionals	10.5	10.9	10.1
2292 Librarians	4.4	2.2	6.7
2293 Mathematicians, Statisticians and Actuaries	0.0	0.0	0.0
2294 Business and Organisation Analysts	7.4	6.9	7.9
2295 Property Professionals	8.7	8.8	8.7
2299 Other Business and Information Professionals	53.9	60.0	36.2
2311 Generalist Medical Practitioners	1.4	1.7	1.1
2312 Specialist Medical Practitioners	7.9	6.9	8.9
2321 Nurse Managers	0.0	0.0	0.0
2322 Nurse Educators and Researchers	11.3	11.7	10.9
2323 Registered Nurses	2.7	3.0	2.2
2324 Registered Midwives	0.0	0.0	0.0
2325 Registered Mental Health Nurses	0.0	0.0	0.0
2326 Registered Developmental Disability Nurses	0.0	0.0	0.0
2381 Dental Practitioners	0.0	0.0	0.0
2382 Pharmacists	0.0	0.0	0.0
2383 Occupational Therapists	0.0	0.0	0.0
2384 Optometrists	0.0	0.0	0.0
2385 Physiotherapists	0.0	0.0	0.0
2386 Speech Pathologists	0.0	0.0	0.0
2387 Chiropractors and Osteopaths	0.0	0.0	0.0
2388 Podiatrists	0.0	0.0	0.0
2391 Medical Imaging Professionals	0.0	0.0	0.0
2392 Veterinarians	0.0	0.0	0.0
2393 Dietitians	2.4	2.6	1.9
2394 Natural Therapy Professionals	0.0	0.0	0.0
2399 Other Health Professionals	0.0	0.0	0.0
2411 Pre-Primary School Teachers	0.0	0.0	0.0
2412 Primary School Teachers	0.0	0.0	0.0
2413 Secondary School Teachers	0.0	0.0	0.0
2414 Special Education Teachers	0.0	0.0	0.0
2421 University Lecturers and Tutors	19.7	23.3	16.2
2422 Vocational Education Teachers	2.3	2.5	1.8
2491 Extra-Systemic Teachers	1.5	1.7	1.2
2492 English as a Second Language Teachers	0.0	0.0	0.0
2493 Education Officers	2.8	3.1	2.2
2511 Social Workers	0.0	0.0	0.0
2512 Welfare and Community Workers	0.0	0.0	0.0
2513 Counsellors	3.1	3.4	2.5
2514 Psychologists	0.0	0.0	0.0
2515 Ministers of Religion	0.0	0.0	0.0
2521 Legal Professionals	12.4	13.4	11.4
2522 Economists	20.9	25.4	16.3
2523 Urban and Regional Planners	0.0	0.0	0.0

Table 5.2 Per cent of service industry occupations from Off-shoring over next two decades – occupations Off-shoring methodology (continued)

Occupations	Per cent of total employment		
	Base scenario	High scenario	Low scenario
2529 Other Social Professionals	8.2	6.9	9.5
2531 Visual Arts and Crafts Professionals	0.0	0.0	0.0
2532 Photographers	0.6	0.7	0.5
2533 Designers and Illustrators	25.6	33.0	18.2
2534 Journalists and Related Professionals	10.3	12.5	8.1
2535 Authors and Related Professionals	27.1	34.7	19.5
2536 Film, Television, Radio and Stage Directors	4.6	2.4	6.9
2537 Musicians and Related Professionals	0.0	0.0	0.0
2538 Actors, Dancers and Related Professionals	30.0	36.6	23.3
2539 Media Presenters	0.0	0.0	0.0
2541 Air Transport Professionals	58.7	60.0	39.3
2542 Sea Transport Professionals	33.7	43.2	24.2
2543 Occupational and Environmental Health Professionals	12.4	14.0	10.8
2549 Other Professionals	12.5	14.0	11.0
3111 Medical Technical Officers	5.7	4.4	7.1
3112 Science Technical Officers	0.0	0.0	0.0
3121 Building, Architectural and Surveying Associate Professionals	4.7	4.7	4.8
3122 Civil Engineering Associate Professionals	8.5	8.6	8.4
3123 Electrical Engineering Associate Professionals	3.2	3.1	3.3
3124 Electronics Engineering Associate Professionals	11.9	13.5	10.3
3125 Mechanical Engineering Associate Professionals	6.3	6.9	5.7
3129 Other Building and Engineering Associate Professionals	2.7	2.7	2.7
3211 Branch Accountants and Managers (Financial Institution)	15.1	17.1	13.1
3212 Financial Dealers and Brokers	22.1	26.9	17.3
3213 Financial Investment Advisers	21.7	26.2	17.1
3291 Office Managers	2.9	0.9	4.9
3292 Project and Program Administrators	19.9	24.6	15.3
3293 Real Estate Associate Professionals	12.0	12.9	11.2
3294 Computing Support Technicians	42.7	56.1	29.3
3311 Shop Managers	0.0	0.0	0.0
3321 Restaurant and Catering Managers	11.1	11.4	10.8
3322 Chefs	0.0	0.0	0.0
3323 Hotel and Motel Managers	0.0	0.0	0.0
3324 Club Managers (Licensed Premises)	0.0	0.0	0.0
3325 Caravan Park and Camping Ground Managers	0.0	0.0	0.0
3329 Other Hospitality and Accommodation Managers	0.0	0.0	0.0
3391 Sport and Recreation Managers	0.0	0.0	0.0
3392 Customer Service Managers	11.5	12.6	10.4
3393 Transport Company Managers	0.0	0.0	0.0
3399 Other Managing Supervisors (Sales and Service)	0.0	0.0	0.0
3411 Enrolled Nurses	0.0	0.0	0.0
3421 Welfare Associate Professionals	0.0	0.0	0.0
3491 Ambulance Officers and Paramedics	0.0	0.0	0.0
3492 Dental Associate Professionals	0.0	0.0	0.0

Table 5.2 Per cent of service industry occupations from Off-shoring over next two decades – occupations Off-shoring methodology (continued)

Occupations	Per cent of total employment		
	Base scenario	High scenario	Low scenario
3493 Aboriginal and Torres Strait Islander Health Workers	0.0	0.0	0.0
3494 Massage Therapists	0.0	0.0	0.0
3911 Police Officers	0.0	0.0	0.0
3991 Primary Products Inspectors	0.0	0.0	0.0
3992 Safety Inspectors	0.0	0.0	0.0
3993 Sportspersons, Coaches and Related Support Workers	15.2	16.6	13.8
3994 Senior Non-Commissioned Defence Force Officers	0.0	0.0	0.0
3995 Senior Fire Fighters	0.0	0.0	0.0
3996 Retail Buyers	16.8	19.7	13.9
3997 Library Technicians	9.2	8.8	9.6
3999 Other Miscellaneous Associate Professionals	0.0	0.0	0.0
4111 General Mechanical Engineering Tradespersons	0.0	0.0	0.0
4112 Metal Fitters and Machinists	0.0	0.0	0.0
4113 Toolmakers	3.0	3.9	2.1
4114 Aircraft Maintenance Engineers	0.0	0.0	0.0
4115 Precision Metal Tradespersons	8.2	8.9	7.6
4121 General Fabrication Engineering Tradespersons	0.0	0.0	0.0
4122 Structural Steel and Welding Tradespersons	0.0	0.0	0.0
4123 Forging Tradespersons	11.1	12.5	9.8
4124 Sheetmetal Tradespersons	1.4	1.7	1.0
4125 Metal Casting Tradespersons	2.5	3.4	1.7
4126 Metal Finishing Tradespersons	1.0	1.0	0.9
4211 Motor Mechanics	0.0	0.0	0.0
4212 Automotive Electricians	0.0	0.0	0.0
4213 Panel Beaters	0.0	0.0	0.0
4214 Vehicle Painters	10.8	11.3	10.4
4215 Vehicle Body Makers	3.0	3.3	2.7
4216 Vehicle Trimmers	9.2	10.5	7.8
4311 Electricians	0.0	0.0	0.0
4312 Refrigeration and Airconditioning Mechanics	5.3	6.1	4.5
4313 Electrical Distribution Tradespersons	0.0	0.0	0.0
4314 Electronic Instrument Tradespersons	0.0	0.0	0.0
4315 Electronic and Office Equipment Tradespersons	18.9	22.9	15.0
4316 Communications Tradespersons	0.0	0.0	0.0
4411 Carpentry and Joinery Tradespersons	0.0	0.0	0.0
4412 Fibrous Plasterers	0.0	0.0	0.0
4413 Roof Slaters and Tilers	1.4	1.6	1.1
4414 Bricklayers	0.0	0.0	0.0
4415 Solid Plasterers	0.0	0.0	0.0
4416 Wall and Floor Tilers and Stonemasons	0.9	0.9	0.9
4421 Painters and Decorators	0.0	0.0	0.0
4422 Signwriters	0.0	0.0	0.0
4423 Floor Finishers	0.0	0.0	0.0
4431 Plumbers	0.0	0.0	0.0
4511 Meat Tradespersons	0.0	0.0	0.0
4512 Bakers and Pastrycooks	0.0	0.0	0.0
4513 Cooks	0.0	0.0	0.0

Table 5.2 Per cent of service industry occupations from Off-shoring over next two decades – occupations Off-shoring methodology (continued)

Occupations	Per cent of total employment		
	Base scenario	High scenario	Low scenario
4519 Other Food Tradespersons	3.6	4.7	2.4
4611 Farm Overseers	0.0	0.0	0.0
4612 Shearers	0.0	0.0	0.0
4613 Wool, Hide and Skin Classers	5.7	6.9	4.5
4614 Animal Trainers	12.0	13.0	11.0
4621 Nurserypersons	6.5	7.1	6.0
4622 Greenkeepers	0.0	0.0	0.0
4623 Gardeners	0.0	0.0	0.0
4911 Graphic Pre-Press Tradespersons	6.0	7.5	4.4
4912 Printing Machinists and Small Offset Printers	0.0	0.0	0.0
4913 Binders and Finishers	0.0	0.0	0.0
4914 Screen Printers	0.0	0.0	0.0
4921 Wood Machinists and Turners	2.5	3.0	1.9
4922 Cabinetmakers	0.0	0.0	0.0
4929 Other Wood Tradespersons	1.5	1.7	1.4
4931 Hairdressers	0.0	0.0	0.0
4941 Clothing Tradespersons	6.5	8.2	4.9
4942 Upholsterers and Bedding Tradespersons	0.0	0.0	0.0
4943 Footwear Tradespersons	0.0	0.0	0.0
4944 Leather Goods, Canvas Goods and Sail Makers	1.4	1.6	1.2
4981 Marine Construction Tradespersons	4.8	6.3	3.3
4982 Glass Tradespersons	1.4	1.4	1.3
4983 Jewellers and Related Tradespersons	5.9	6.6	5.3
4984 Florists	0.0	0.0	0.0
4985 Fire Fighters	21.7	26.4	17.0
4986 Drillers	2.2	2.5	1.8
4987 Chemical, Petroleum and Gas Plant Operators	0.0	0.0	0.0
4988 Power Generation Plant Operators	1.0	1.3	0.8
4991 Defence Force Members Not Elsewhere Included	0.0	0.0	0.0
4992 Performing Arts Support Workers	21.5	25.8	17.3
4999 Other Miscellaneous Tradespersons and Related Workers	9.0	9.3	8.6
5111 Secretaries and Personal Assistants	7.4	7.2	7.6
5911 Bookkeepers	0.0	0.0	0.0
5912 Credit and Loans Officers	16.5	19.1	14.0
5991 Advanced Legal and Related Clerks	17.6	20.6	14.6
5992 Court and Hansard Reporters	0.0	0.0	0.0
5993 Insurance Agents	23.7	28.9	18.4
5994 Insurance Risk Surveyors, Investigators and Loss Adjusters	0.0	0.0	0.0
5995 Desktop Publishing Operators	0.0	0.0	0.0
5996 Travel Attendants	0.0	0.0	0.0
5999 Other Miscellaneous Advanced Clerical and Service Workers	13.2	14.1	12.3
6111 General Clerks	14.4	16.8	12.1
6121 Keyboard Operators	25.6	32.4	18.9
6131 Receptionists	0.0	0.0	0.0

Table 5.2 Per cent of service industry occupations from Off-shoring over next two decades – occupations Off-shoring methodology (continued)

Occupations	Per cent of total employment		
	Base scenario	High scenario	Low scenario
6141 Accounting Clerks	18.7	23.2	14.3
6142 Payroll Clerks	19.0	23.4	14.6
6143 Bank Workers	26.4	32.9	20.0
6144 Insurance Clerks	0.0	0.0	0.0
6145 Money Market and Statistical Clerks	0.0	0.0	0.0
6151 Production Recording Clerks	12.1	15.1	9.1
6152 Transport and Despatching Clerks	10.0	10.9	9.1
6153 Stock and Purchasing Clerks	15.3	18.4	12.3
6191 Inquiry and Admissions Clerks	3.7	1.4	5.9
6192 Library Assistants	0.0	0.0	0.0
6193 Personnel Clerks	6.8	5.9	7.7
6194 Intermediate Inspectors and Examiners	4.8	2.7	6.9
6199 Other Intermediate Clerical Workers	6.2	4.9	7.4
6211 Sales Representatives	4.0	2.2	5.9
6212 Motor Vehicle and Related Products Salespersons	0.0	0.0	0.0
6213 Retail and Checkout Supervisors	0.0	0.0	0.0
6311 Education Aides	0.0	0.0	0.0
6312 Children's Care Workers	0.0	0.0	0.0
6313 Special Care Workers	0.0	0.0	0.0
6314 Personal Care and Nursing Assistants	0.0	0.0	0.0
6321 Hotel Service Supervisors	3.5	4.2	2.8
6322 Bar Attendants	0.0	0.0	0.0
6323 Waiters	0.0	0.0	0.0
6324 Hospitality Trainees	0.0	0.0	0.0
6391 Dental Assistants	0.0	0.0	0.0
6392 Veterinary Nurses	0.0	0.0	0.0
6393 Prison Officers	0.0	0.0	0.0
6394 Gaming Workers	23.4	28.6	18.2
6395 Personal Care Consultants	0.0	0.0	0.0
6396 Fitness Instructors and Related Workers	0.0	0.0	0.0
6397 Travel and Tourism Agents	22.0	26.6	17.3
6399 Other Intermediate Service Workers	0.0	0.0	0.0
7111 Mobile Construction Plant Operators	0.0	0.0	0.0
7112 Forklift Drivers	0.0	0.0	0.0
7119 Other Mobile Plant Operators	0.0	0.0	0.0
7121 Engine and Boiler Operators	0.0	0.0	0.0
7122 Crane, Hoist and Lift Operators	0.0	0.0	0.0
7123 Engineering Production Systems Workers	0.0	0.0	0.0
7124 Pulp and Paper Mill Operators	1.0	1.0	0.9
7129 Other Intermediate Stationary Plant Operators	0.0	0.0	0.0
7211 Sewing Machinists	0.4	0.5	0.3
7212 Textile and Footwear Production Machine Operators	0.3	0.1	0.5
7291 Plastics Production Machine Operators	0.3	0.1	0.5
7292 Rubber Production Machine Operators	0.5	0.3	0.8
7293 Chemical Production Machine Operators	0.5	0.3	0.7
7294 Wood Processing Machine Operators	0.0	0.0	0.0
7295 Paper Products Machine Operators	0.5	0.3	0.7

Table 5.2 Per cent of service industry occupations from Off-shoring over next two decades – occupations Off-shoring methodology (continued)

Occupations	Per cent of total employment		
	Base scenario	High scenario	Low scenario
7296 Glass Production Machine Operators	0.0	0.0	0.0
7297 Clay, Stone and Concrete Processing Machine Operators	0.4	0.1	0.7
7298 Photographic Developers and Printers	1.3	1.6	1.1
7299 Other Intermediate Machine Operators	0.4	0.5	0.4
7311 Truck Drivers	0.0	0.0	0.0
7312 Bus and Tram Drivers	0.0	0.0	0.0
7313 Automobile Drivers	0.0	0.0	0.0
7314 Delivery Drivers	0.0	0.0	0.0
7315 Train Drivers and Assistants	0.0	0.0	0.0
7911 Miners	0.0	0.0	0.0
7912 Blasting Workers	0.0	0.0	0.0
7913 Structural Steel Construction Workers	0.0	0.0	0.0
7914 Insulation and Home Improvements Installers	0.0	0.0	0.0
7991 Motor Vehicle Parts and Accessories Fitters	0.0	0.0	0.0
7992 Product Quality Controllers	0.5	0.6	0.4
7993 Storepersons	0.0	0.0	0.0
7994 Seafarers and Fishing Hands	0.0	0.0	0.0
7995 Forestry and Logging Workers	0.0	0.0	0.0
7996 Printing Hands	0.0	0.0	0.0
8111 Registry and Filing Clerks	12.7	14.1	11.2
8112 Mail Sorting Clerks	0.0	0.0	0.0
8113 Switchboard Operators	34.4	44.3	24.4
8114 Messengers	0.0	0.0	0.0
8115 Betting Clerks	0.0	0.0	0.0
8116 Office Trainees	19.9	24.2	15.7
8119 Other Elementary Clerks	15.0	16.2	13.8
8211 Sales Assistants	0.0	0.0	0.0
8291 Checkout Operators and Cashiers	0.0	0.0	0.0
8292 Ticket Salespersons	15.9	18.1	13.7
8293 Street Vendors and Related Workers	0.0	0.0	0.0
8294 Telemarketers	42.9	56.2	29.5
8295 Sales Demonstrators and Models	9.7	7.5	11.8
8296 Service Station Attendants	0.0	0.0	0.0
8297 Sales and Service Trainees	0.0	0.0	0.0
8299 Other Elementary Sales Workers	0.0	0.0	0.0
8311 Guards and Security Officers	0.0	0.0	0.0
8312 Ushers, Porters and Related Workers	0.0	0.0	0.0
8313 Domestic Housekeepers	0.0	0.0	0.0
8314 Caretakers	0.0	0.0	0.0
8315 Laundry Workers	0.0	0.0	0.0
8319 Other Elementary Service Workers	22.5	27.2	17.7
9111 Cleaners	0.0	0.0	0.0
9211 Engineering Production Process Workers	0.0	0.0	0.0
9212 Product Assemblers	0.0	0.0	0.0
9213 Meat and Fish Process Workers	0.0	0.0	0.0
9214 Other Food Factory Hands	0.0	0.0	0.0

Table 5.2 Per cent of service industry occupations from Off-shoring over next two decades – occupations Off-shoring methodology (continued)			
	Per cent of total employment		
Occupations	**Base scenario**	**High scenario**	**Low scenario**
9215 Wood Products Factory Hands	0.0	0.0	0.0
9219 Other Process Workers	0.0	0.0	0.0
9221 Hand Packers	0.0	0.0	0.0
9222 Packagers and Container Fillers	0.0	0.0	0.0
9911 Mining Support Workers and Driller's Assistants	0.0	0.0	0.0
9912 Earthmoving Labourers	0.0	0.0	0.0
9913 Paving and Surfacing Labourers	0.0	0.0	0.0
9914 Survey Hands	0.0	0.0	0.0
9915 Railway Labourers	0.0	0.0	0.0
9916 Construction and Plumber's Assistants	0.0	0.0	0.0
9917 Concreters	0.0	0.0	0.0
9918 Electrical and Telecommunications Trades Assistants	0.0	0.0	0.0
9919 Other Mining, Construction and Related Labourers	0.0	0.0	0.0
9921 Farm Hands	0.0	0.0	0.0
9922 Nursery and Garden Labourers	0.0	0.0	0.0
9929 Other Agricultural and Horticultural Labourers	0.0	0.0	0.0
9931 Kitchenhands	0.0	0.0	0.0
9932 Fast Food Cooks	0.0	0.0	0.0
9933 Food Trades Assistants	0.0	0.0	0.0
9991 Garbage Collectors	0.0	0.0	0.0
9992 Freight and Furniture Handlers	0.0	0.0	0.0
9993 Handypersons	0.0	0.0	0.0
9999 Other Miscellaneous Labourers and Related Workers	0.0	0.0	0.0
Total as a per cent of tertiary sector employment	7.0	8.2	5.2
Total – 2006-07	**610994**	**715666**	**505541**

6. Consistent industry-occupation methodology: Scenarios for Off-shoring service industry employment loss

A consistent, combined industry-occupation methodology is developed in the following manner. Firstly, the industry methodology scenarios of Table 5.1 are accepted as the first component of the Off-shoring employment losses. Next, for the remaining service industry employment, the occupation methodology is applied to assess the employment loss from Off-shoring of that industry segment that services the industry import replacement effect.

The two components, in terms of the occupational impact, are shown in Table 6.1. By this is meant that the industry employment loss estimates given in Table 5.1 are translated in occupational employment losses. This is done by applying a 4-digit ANZSIC by 4-digit ASCO occupational matrix to the data in Table 5.1 to obtain the 4-digit ASCO estimates in the first three columns of Table 6.1. The total for Table 5.1 is the same as the totals for the corresponding columns in Table 6.1.

For 2006 the total 4-digit ASCO occupation by 4-digit ANZSIC industry estimates are adjusted by deducing the 4-digit ASCO by 4-digit ANZSIC flow estimates underlying the results in the first three columns in Table 6.1. The residual industry by occupational employment is then subjected to the methodology outlined in Chapter 4 above. The results are given in the fourth to sixth columns of Table 6.1. The correlation of the industry and occupational employment loss from Off-shoring gives the total impact and these estimates for the three scenarios are given in the last three columns of Table 6.1.

Thus, from Table 6.1, the base case occupational Off-shoring is 570,000. Because of the elimination of industry Off-shoring this is down from the 611,000 of Table 5.2.

In terms of the overall total, the base case is for an employment loss of 9.7 per cent of tertiary sector employment, or 0.85 million for the employment levels of 2007. By circa 2025, the 0.85 would grow to approximately 1.1 million.

The range around the base case is a low of 0.7 million to a high of 1.0 million. However, it has to be kept in mind that as a percentage of total employment, as Table 6.1 indicates, the employment loss is 8.2 per cent. This is well below the American estimates and well below the OECD estimates for Australia. If the build-up to the estimated loss of 9.7 per cent of total tertiary sector employment, and if the Off-shoring proceeds fairly uniformly over the next two decades, then the impact of Off-shoring will be the same as a 0.5 per cent per annum increase in tertiary sector labour productivity in gross headline equivalent terms. However, as will be seen below, the flow-on impact on the economy of Off-shoring and labour productivity increases are inherently different in terms of overall total outcomes.

Table 6.2 converts the data in Table 6.1 into absolute losses in employment, given 2006-07 occupational demand levels. Some of the occupation losses may look a little odd, for example truck drivers. It has to be kept in mind, however, that the occupation losses include the industry occupation loss which will impact on truck drivers. The truck driver row in Table 6.1 verifies this point. The largest estimated employment losses are in computing professionals with a loss of 81,200 for the base case. Computing professional employment losses represents 9.6 per cent of total employment losses for the base case. Another occupation category to face employment losses is accountants. For the base case the loss is 34,300.

Table 6.3 aggregates the results from Table 6.2. The most noteworthy aspect is that 60 per cent of the employment losses in the higher skilled categories (managers, professionals, etc.) with most of the rest being in the medium skilled category. The low skilled employment losses contribute just under 8 per cent of the employment losses. Low skilled occupations in the main require face to face contact on on-site application of manual labour. Therefore, the

occupations have natural protective barriers against the influences of the communications revolution.

Table 6.4 shows the impact of the base case at the Local Government level. The percentages are the per cent of total employment. The greatest impact falls on the capital city CBDs. This is to be expected since these centres over the past four decades have been exporting services to non-metropolitan regions. That is, they are at risk because their output represents a high degree of tradeable services.

Finally it should be kept in mind that there are constant changes in the application of occupations to particular types of jobs, as well as the skill content of occupations. These projections are for the situation that prevailed over the 2001 to 2006 period. By 2025 the occupational structure may look different in terms of the relative employment loss.

Table 6.1 Per cent of service industry occupations from Off-shoring over the next two decades – occupations and industry Off-shoring combined

	Industry impact			Occupational impact in remaining industry			Total impact		
	Base scenario	High scenario	Low scenario	Base scenario	High scenario	Low scenario	Base scenario	High scenario	Low scenario
1111 Legislators and Government Appointed Officials	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1112 General Managers	4.1	5.1	3.2	8.6	9.0	8.2	12.7	14.0	11.4
1191 Building and Construction Managers	0.4	0.4	0.3	0.0	0.0	0.0	0.4	0.4	0.3
1192 Importers, Exporters and Wholesalers	9.9	11.1	8.8	16.7	19.5	13.7	26.6	30.6	22.5
1193 Manufacturers	0.6	0.7	0.6	0.0	0.0	0.0	0.6	0.7	0.6
1211 Finance Managers	5.5	6.7	4.2	14.8	17.3	12.2	20.3	24.0	16.5
1212 Company Secretaries	4.2	5.2	3.3	7.9	8.3	7.5	12.2	13.5	10.8
1213 Human Resource Managers	5.2	6.6	3.8	14.9	17.3	12.4	20.1	23.9	16.2
1221 Engineering Managers	2.4	3.1	1.7	6.2	6.6	5.7	8.5	9.7	7.4
1222 Production Managers	1.2	1.4	1.0	1.3	1.1	1.5	2.5	2.5	2.5
1223 Supply and Distribution Managers	2.6	3.0	2.2	17.9	21.8	13.9	20.5	24.8	16.1
1224 Information Technology Managers	12.0	16.2	7.8	22.5	26.8	17.6	34.5	43.1	25.4
1231 Sales and Marketing Managers	5.8	7.1	4.6	14.5	17.0	12.0	20.3	24.1	16.6
1291 Policy and Planning Managers	2.2	2.8	1.6	19.1	22.9	15.4	21.3	25.6	17.0
1292 Health Services Managers	0.4	0.5	0.3	3.3	3.9	2.6	3.6	4.4	2.9
1293 Education Managers	0.2	0.2	0.1	0.0	0.0	0.0	0.2	0.2	0.1
1294 Commissioned Officers (Management)	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1
1295 Child Care Co-ordinators	0.1	0.1	0.1	2.0	2.4	1.6	2.1	2.5	1.7
1296 Media Producers and Artistic Directors	1.1	1.5	0.8	20.1	24.4	15.7	21.2	25.9	16.5
1299 Other Specialist Managers	4.1	5.2	3.0	9.5	9.9	9.0	13.6	15.1	12.0
1311 Mixed Crop and Livestock Farmers	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1312 Livestock Farmers	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1
1313 Crop Farmers	0.4	0.5	0.4	0.0	0.0	0.0	0.4	0.5	0.4
1314 Aquaculture Farmers	0.8	0.9	0.8	0.0	0.0	0.0	0.8	0.9	0.8
2111 Chemists	2.4	3.1	1.8	15.1	19.1	11.0	17.5	22.1	12.8
2112 Geologists and Geophysicists	2.1	2.8	1.5	10.9	13.1	8.6	13.0	15.8	10.1
2113 Life Scientists	7.0	9.0	5.0	38.6	49.2	27.5	45.6	58.2	32.5
2114 Environmental and Agricultural Science Professionals	5.2	6.5	3.8	0.0	0.0	0.0	5.2	6.5	3.8

Table 6.1 Per cent of service industry occupations from Off-shoring over the next two decades – occupations and industry Off-shoring combined (continued)

	Industry impact			Occupational impact in remaining industry			Total impact		
	Base scenario	High scenario	Low scenario	Base scenario	High scenario	Low scenario	Base scenario	High scenario	Low scenario
2115 Medical Scientists	3.8	5.0	2.7	22.3	27.0	17.4	26.1	32.0	20.2
2119 Other Natural and Physical Science Professionals	3.2	4.2	2.3	13.5	15.8	11.2	16.8	20.0	13.5
2121 Architects and Landscape Architects	0.5	0.6	0.3	16.6	20.0	13.2	17.0	20.5	13.6
2122 Quantity Surveyors	1.1	1.3	0.9	9.3	9.9	8.7	10.4	11.2	9.6
2123 Cartographers and Surveyors	1.4	1.8	1.0	8.4	8.7	8.2	9.8	10.4	9.2
2124 Civil Engineers	0.5	0.6	0.4	7.5	7.5	7.5	8.0	8.1	7.9
2125 Electrical and Electronics Engineers	7.0	9.4	4.5	6.4	6.3	6.4	13.3	15.7	10.9
2126 Mechanical, Production and Plant Engineers	1.0	1.2	0.9	3.1	2.9	3.4	4.2	4.1	4.2
2127 Mining and Materials Engineers	1.2	1.4	0.9	0.0	0.0	0.0	1.2	1.4	0.9
2128 Engineering Technologists	6.8	9.4	4.2	10.4	12.0	8.6	17.3	21.4	12.9
2129 Other Building and Engineering Professionals	2.1	2.7	1.6	6.8	7.2	6.4	8.9	9.9	8.0
2211 Accountants	10.1	12.7	7.5	11.5	12.5	10.3	21.6	25.2	17.9
2212 Auditors	6.7	8.4	5.0	0.0	0.0	0.0	6.7	8.4	5.0
2213 Corporate Treasurers	7.5	8.8	6.2	21.0	25.8	16.0	28.5	34.6	22.2
2221 Marketing and Advertising Professionals	6.7	8.4	4.9	14.2	16.2	12.1	20.9	24.7	17.0
2222 Technical Sales Representatives	10.5	13.3	7.6	13.3	15.0	11.5	23.8	28.3	19.1
2231 Computing Professionals	14.0	18.8	9.1	30.8	37.5	23.0	44.8	56.4	32.1
2291 Human Resource Professionals	7.2	9.1	5.3	9.7	9.9	9.5	16.9	19.0	14.8
2292 Librarians	5.6	6.8	4.5	4.2	2.0	6.4	9.8	8.8	10.8
2293 Mathematicians, Statisticians and Actuaries	5.6	7.1	4.1	0.0	0.0	0.0	5.6	7.1	4.1
2294 Business and Organisation Analysts	9.7	12.3	7.1	6.5	5.9	7.2	16.2	18.2	14.3
2295 Property Professionals	4.5	5.5	3.5	8.3	8.2	8.3	12.7	13.7	11.8
2299 Other Business and Information Professionals	3.1	3.9	2.2	52.2	68.7	35.4	55.3	72.6	37.6
2311 Generalist Medical Practitioners	0.1	0.1	0.1	1.4	1.7	1.1	1.5	1.8	1.2
2312 Specialist Medical Practitioners	0.3	0.4	0.2	7.9	6.9	8.9	8.1	7.2	9.1
2321 Nurse Managers	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1
2322 Nurse Educators and Researchers	1.1	1.4	0.8	11.2	11.5	10.8	12.2	12.9	11.5
2323 Registered Nurses	0.2	0.2	0.2	2.7	3.0	2.2	2.9	3.2	2.3
2324 Registered Midwives	0.1	0.2	0.1	0.0	0.0	0.0	0.1	0.2	0.1

Table 6.1 Per cent of service industry occupations from Off-shoring over the next two decades – occupations and industry Off-shoring combined (continued)

	Industry impact			Occupational impact in remaining industry			Total impact		
	Base scenario	High scenario	Low scenario	Base scenario	High scenario	Low scenario	Base scenario	High scenario	Low scenario
2325 Registered Mental Health Nurses	0.2	0.2	0.2	0.0	0.0	0.0	0.2	0.2	0.2
2326 Registered Developmental Disability Nurses	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2381 Dental Practitioners	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1
2382 Pharmacists	0.5	0.7	0.4	0.0	0.0	0.0	0.5	0.7	0.4
2383 Occupational Therapists	0.6	0.7	0.4	0.0	0.0	0.0	0.6	0.7	0.4
2384 Optometrists	0.2	0.2	0.1	0.0	0.0	0.0	0.2	0.2	0.1
2385 Physiotherapists	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1
2386 Speech Pathologists	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.0
2387 Chiropractors and Osteopaths	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2388 Podiatrists	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.0
2391 Medical Imaging Professionals	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1
2392 Veterinarians	0.3	0.4	0.3	0.0	0.0	0.0	0.3	0.4	0.3
2393 Dieticians	0.5	0.6	0.4	2.4	2.6	1.9	2.9	3.3	2.3
2394 Natural Therapy Professionals	0.3	0.3	0.2	0.0	0.0	0.0	0.3	0.3	0.2
2399 Other Health Professionals	0.2	0.3	0.2	0.0	0.0	0.0	0.2	0.3	0.2
2411 Pre-Primary School Teachers	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0
2412 Primary School Teachers	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2413 Secondary School Teachers	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2414 Special Education Teachers	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1
2421 University Lecturers and Tutors	0.1	0.1	0.1	19.7	23.3	16.2	19.8	23.4	16.2
2422 Vocational Education Teachers	0.4	0.5	0.3	2.3	2.5	1.8	2.6	3.0	2.1
2491 Extra-Systemic Teachers	1.3	1.6	0.9	1.5	1.7	1.2	2.8	3.3	2.1
2492 English as a Second Language Teachers	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1
2493 Education Officers	1.0	1.3	0.8	2.8	3.0	2.2	3.8	4.4	3.0
2511 Social Workers	0.4	0.5	0.3	0.0	0.0	0.0	0.4	0.5	0.3
2512 Welfare and Community Workers	0.7	0.9	0.5	0.0	0.0	0.0	0.7	0.9	0.5
2513 Counsellors	1.4	1.7	1.0	3.1	3.4	2.5	4.5	5.1	3.5
2514 Psychologists	0.9	1.1	0.7	0.0	0.0	0.0	0.9	1.1	0.7
2515 Ministers of Religion	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1
2521 Legal Professionals	14.9	19.0	10.7	10.5	10.8	10.2	25.4	29.8	20.8
2522 Economists	6.0	7.5	4.6	19.5	23.4	15.6	25.6	30.9	20.1
2523 Urban and Regional Planners	1.1	1.3	0.8	0.0	0.0	0.0	1.1	1.3	0.8

Table 6.1 Per cent of service industry occupations from Off-shoring over the next two decades – occupations and industry Off-shoring combined (continued)

	Industry impact			Occupational impact in remaining industry			Total impact		
	Base scenario	High scenario	Low scenario	Base scenario	High scenario	Low scenario	Base scenario	High scenario	Low scenario
2529 Other Social Professionals	6.8	8.0	5.6	7.7	6.4	9.1	14.5	14.4	14.7
2531 Visual Arts and Crafts Professionals	0.9	1.1	0.7	0.0	0.0	0.0	0.9	1.1	0.7
2532 Photographers	0.5	0.7	0.4	0.6	0.7	0.5	1.2	1.4	0.9
2533 Designers and Illustrators	4.0	5.2	2.9	24.1	30.6	17.4	28.1	35.7	20.3
2534 Journalists and Related Professionals	2.1	2.7	1.4	9.9	11.8	7.8	11.9	14.5	9.3
2535 Authors and Related Professionals	1.6	2.1	1.2	26.5	33.8	19.2	28.2	35.9	20.4
2536 Film, Television, Radio and Stage Directors	1.6	2.2	1.1	4.6	2.4	6.8	6.2	4.6	7.9
2537 Musicians and Related Professionals	0.5	0.6	0.4	0.0	0.0	0.0	0.5	0.6	0.4
2538 Actors, Dancers and Related Professionals	3.4	4.0	2.8	29.2	35.5	22.8	32.6	39.5	25.7
2539 Media Presenters	1.2	1.5	0.9	0.0	0.0	0.0	1.2	1.5	0.9
2541 Air Transport Professionals	0.2	0.2	0.1	58.6	77.9	39.3	58.8	78.1	39.4
2542 Sea Transport Professionals	1.1	1.3	0.9	33.3	42.6	24.0	34.4	43.9	24.8
2543 Occupational and Environmental Health Professionals	2.2	2.7	1.7	12.1	13.6	10.6	14.3	16.3	12.3
2549 Other Professionals	1.0	1.2	0.8	12.3	13.8	10.9	13.3	15.0	11.7
3111 Medical Technical Officers	0.7	0.8	0.5	5.7	4.3	7.1	6.4	5.2	7.5
3112 Science Technical Officers	2.9	3.8	2.1	0.0	0.0	0.0	2.9	3.8	2.1
3121 Building, Architectural and Surveying Associate Professionals	0.9	1.1	0.6	4.7	4.6	4.7	5.5	5.7	5.3
3122 Civil Engineering Associate Professionals	0.4	0.5	0.3	8.5	8.6	8.4	8.9	9.1	8.7
3123 Electrical Engineering Associate Professionals	1.2	1.5	1.0	3.1	2.9	3.2	4.3	4.5	4.1
3124 Electronics Engineering Associate Professionals	7.5	10.3	4.8	10.8	11.8	9.7	18.3	22.0	14.4
3125 Mechanical Engineering Associate Professionals	0.9	1.1	0.8	6.1	6.7	5.6	7.1	7.8	6.4
3129 Other Building and Engineering Associate Professionals	0.8	1.0	0.7	2.6	2.6	2.6	3.4	3.6	3.3
3211 Branch Accountants and Managers (Financial Institution)	11.1	12.5	9.7	13.5	15.0	11.8	24.5	27.5	21.5
3212 Financial Dealers and Brokers	7.1	8.6	5.7	20.5	24.6	16.3	27.6	33.2	21.9
3213 Financial Investment Advisers	5.2	6.2	4.2	20.6	24.6	16.4	25.8	30.8	20.6
3291 Office Managers	3.8	4.7	3.0	2.8	0.8	4.8	6.6	5.5	7.7
3292 Project and Program Administrators	3.8	4.9	2.8	19.0	23.1	14.8	22.9	28.0	17.6

Table 6.1 Per cent of service industry occupations from Off-shoring over the next two decades – occupations and industry Off-shoring combined (continued)

	Industry impact			Occupational impact in remaining industry			Total impact		
	Base scenario	High scenario	Low scenario	Base scenario	High scenario	Low scenario	Base scenario	High scenario	Low scenario
3293 Real Estate Associate Professionals	0.7	0.9	0.6	11.9	12.7	11.1	12.7	13.7	11.7
3294 Computing Support Technicians	10.1	13.5	6.6	38.0	47.8	27.1	48.0	61.3	33.7
3311 Shop Managers	1.0	1.1	0.9	0.0	0.0	0.0	1.0	1.1	0.9
3321 Restaurant and Catering Managers	0.3	0.3	0.2	11.1	11.4	10.8	11.3	11.7	11.0
3322 Chefs	0.2	0.2	0.1	0.0	0.0	0.0	0.2	0.2	0.1
3323 Hotel and Motel Managers	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1
3324 Club Managers (Licensed Premises)	0.2	0.3	0.2	0.0	0.0	0.0	0.2	0.3	0.2
3325 Caravan Park and Camping Ground Managers	0.2	0.3	0.2	0.0	0.0	0.0	0.2	0.3	0.2
3329 Other Hospitality and Accommodation Managers	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1
3391 Sport and Recreation Managers	1.4	1.6	1.3	0.0	0.0	0.0	1.4	1.6	1.3
3392 Customer Service Managers	5.3	6.7	3.9	10.8	11.6	9.9	16.1	18.3	13.8
3393 Transport Company Managers	0.7	0.8	0.7	0.0	0.0	0.0	0.7	0.8	0.7
3399 Other Managing Supervisors (Sales and Service)	3.4	4.2	2.6	0.0	0.0	0.0	3.4	4.2	2.6
3411 Enrolled Nurses	0.2	0.2	0.2	0.0	0.0	0.0	0.2	0.2	0.2
3421 Welfare Associate Professionals	1.0	1.3	0.8	0.0	0.0	0.0	1.0	1.3	0.8
3491 Ambulance Officers and Paramedics	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3492 Dental Associate Professionals	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.0
3493 Aboriginal and Torres Strait Islander Health Workers	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.0
3494 Massage Therapists	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3911 Police Officers	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0
3991 Primary Products Inspectors	1.6	1.8	1.4	0.0	0.0	0.0	1.6	1.8	1.4
3992 Safety Inspectors	3.2	3.9	2.5	0.0	0.0	0.0	3.2	3.9	2.5
3993 Sportspersons, Coaches and Related Support Workers	0.4	0.4	0.3	15.1	16.5	13.7	15.5	16.9	14.0
3994 Senior Non-Commissioned Defence Force Officers	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.0
3995 Senior Fire Fighters	0.3	0.4	0.2	0.0	0.0	0.0	0.3	0.4	0.2
3996 Retail Buyers	3.1	3.5	2.7	16.3	19.0	13.5	19.3	22.5	16.2
3997 Library Technicians	6.6	7.8	5.3	8.6	8.1	9.1	15.2	15.9	14.4

Table 6.1 Per cent of service industry occupations from Off-shoring over the next two decades – occupations and industry Off-shoring combined (continued)

	Industry impact			Occupational impact in remaining industry			Total impact		
	Base scenario	High scenario	Low scenario	Base scenario	High scenario	Low scenario	Base scenario	High scenario	Low scenario
3999 Other Miscellaneous Associate Professionals	2.1	2.6	1.7	0.0	0.0	0.0	2.1	2.6	1.7
4111 General Mechanical Engineering Tradespersons	0.9	1.0	0.9	0.0	0.0	0.0	0.9	1.0	0.9
4112 Metal Fitters and Machinists	0.9	1.0	0.9	0.0	0.0	0.0	0.9	1.0	0.9
4113 Toolmakers	0.4	0.4	0.3	2.8	3.7	2.0	3.2	4.1	2.3
4114 Aircraft Maintenance Engineers	0.3	0.3	0.2	0.0	0.0	0.0	0.3	0.3	0.2
4115 Precision Metal Tradespersons	1.7	2.1	1.4	8.0	8.6	7.4	9.7	10.7	8.8
4121 General Fabrication Engineering Tradespersons	0.4	0.4	0.4	0.0	0.0	0.0	0.4	0.4	0.4
4122 Structural Steel and Welding Tradespersons	0.5	0.6	0.5	0.0	0.0	0.0	0.5	0.6	0.5
4123 Forging Tradespersons	0.7	0.7	0.7	11.0	12.3	9.7	11.7	13.1	10.4
4124 Sheetmetal Tradespersons	0.3	0.3	0.2	1.3	1.6	1.0	1.6	1.9	1.2
4125 Metal Casting Tradespersons	0.2	0.2	0.2	2.4	3.2	1.6	2.7	3.4	1.9
4126 Metal Finishing Tradespersons	0.3	0.3	0.3	0.9	1.0	0.8	1.2	1.3	1.1
4211 Motor Mechanics	0.7	0.7	0.7	0.0	0.0	0.0	0.7	0.7	0.7
4212 Automotive Electricians	0.4	0.3	0.4	0.0	0.0	0.0	0.4	0.3	0.4
4213 Panel Beaters	0.1	0.2	0.1	0.0	0.0	0.0	0.1	0.2	0.1
4214 Vehicle Painters	0.3	0.3	0.3	10.8	11.2	10.3	11.1	11.6	10.6
4215 Vehicle Body Makers	0.2	0.3	0.2	3.0	3.3	2.7	3.2	3.6	2.9
4216 Vehicle Trimmers	0.2	0.2	0.2	9.1	10.5	7.8	9.4	10.7	8.0
4311 Electricians	0.8	0.9	0.6	0.0	0.0	0.0	0.8	0.9	0.6
4312 Refrigeration and Airconditioning Mechanics	1.0	1.2	0.9	5.1	5.9	4.3	6.2	7.0	5.3
4313 Electrical Distribution Tradespersons	0.4	0.5	0.2	0.0	0.0	0.0	0.4	0.5	0.2
4314 Electronic Instrument Tradespersons	2.7	3.4	2.0	0.0	0.0	0.0	2.7	3.4	2.0
4315 Electronic and Office Equipment Tradespersons	6.8	8.8	4.8	17.5	20.7	14.2	24.3	29.4	19.0
4316 Communications Tradespersons	25.0	35.0	15.0	0.0	0.0	0.0	25.0	35.0	15.0
4411 Carpentry and Joinery Tradespersons	0.3	0.3	0.3	0.0	0.0	0.0	0.3	0.3	0.3
4412 Fibrous Plasterers	0.2	0.2	0.2	0.0	0.0	0.0	0.2	0.2	0.2
4413 Roof Slaters and Tilers	0.3	0.4	0.3	1.3	1.5	1.1	1.6	1.9	1.3
4414 Bricklayers	0.1	0.2	0.1	0.0	0.0	0.0	0.1	0.2	0.1
4415 Solid Plasterers	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1

Table 6.1 Per cent of service industry occupations from Off-shoring over the next two decades – occupations and industry Off-shoring combined (continued)

	Industry impact			Occupational impact in remaining industry			Total impact		
	Base scenario	High scenario	Low scenario	Base scenario	High scenario	Low scenario	Base scenario	High scenario	Low scenario
4416 Wall and Floor Tilers and Stonemasons	0.3	0.3	0.3	0.9	0.9	0.9	1.2	1.2	1.2
4421 Painters and Decorators	0.3	0.3	0.2	0.0	0.0	0.0	0.3	0.3	0.2
4422 Signwriters	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1
4423 Floor Finishers	0.9	1.1	0.7	0.0	0.0	0.0	0.9	1.1	0.7
4431 Plumbers	0.3	0.4	0.3	0.0	0.0	0.0	0.3	0.4	0.3
4511 Meat Tradespersons	1.4	1.1	1.7	0.0	0.0	0.0	1.4	1.1	1.7
4512 Bakers and Pastrycooks	0.7	0.6	0.8	0.0	0.0	0.0	0.7	0.6	0.8
4513 Cooks	0.2	0.2	0.2	0.0	0.0	0.0	0.2	0.2	0.2
4519 Other Food Tradespersons	0.3	0.3	0.3	3.4	4.5	2.3	3.7	4.8	2.6
4611 Farm Overseers	0.9	1.0	0.7	0.0	0.0	0.0	0.9	1.0	0.7
4612 Shearers	0.3	0.3	0.2	0.0	0.0	0.0	0.3	0.3	0.2
4613 Wool, Hide and Skin Classers	2.7	3.2	2.2	5.2	6.1	4.2	7.9	9.3	6.4
4614 Animal Trainers	0.2	0.2	0.2	12.0	13.0	11.0	12.2	13.2	11.2
4621 Nurserypersons	0.4	0.4	0.4	6.5	7.0	6.0	6.9	7.4	6.4
4622 Greenkeepers	0.3	0.4	0.3	0.0	0.0	0.0	0.3	0.4	0.3
4623 Gardeners	0.4	0.5	0.4	0.0	0.0	0.0	0.4	0.5	0.4
4911 Graphic Pre-Press Tradespersons	0.3	0.4	0.2	5.9	7.4	4.3	6.2	7.7	4.6
4912 Printing Machinists and Small Offset Printers	0.4	0.5	0.3	0.0	0.0	0.0	0.4	0.5	0.3
4913 Binders and Finishers	0.4	0.5	0.4	0.0	0.0	0.0	0.4	0.5	0.4
4914 Screen Printers	0.5	0.6	0.4	0.0	0.0	0.0	0.5	0.6	0.4
4921 Wood Machinists and Turners	0.6	0.5	0.6	2.3	2.9	1.8	2.9	3.4	2.4
4922 Cabinetmakers	0.2	0.2	0.2	0.0	0.0	0.0	0.2	0.2	0.2
4929 Other Wood Tradespersons	0.6	0.7	0.6	1.5	1.6	1.3	2.1	2.3	1.9
4931 Hairdressers	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4941 Clothing Tradespersons	0.9	1.2	0.7	6.3	7.8	4.7	7.2	8.9	5.4
4942 Upholsterers and Bedding Tradespersons	0.2	0.3	0.2	0.0	0.0	0.0	0.2	0.3	0.2
4943 Footwear Tradespersons	0.4	0.5	0.3	0.0	0.0	0.0	0.4	0.5	0.3
4944 Leather Goods, Canvas Goods and Sail Makers	0.4	0.5	0.4	1.4	1.5	1.2	1.8	2.0	1.6
4981 Marine Construction Tradespersons	0.2	0.2	0.2	4.7	6.2	3.2	4.9	6.4	3.4
4982 Glass Tradespersons	0.5	0.4	0.5	1.3	1.4	1.3	1.8	1.8	1.8
4983 Jewellers and Related Tradespersons	1.2	1.5	0.9	5.8	6.4	5.2	7.0	7.9	6.1

Table 6.1 Per cent of service industry occupations from Off-shoring over the next two decades – occupations and industry Off-shoring combined (continued)

	Industry impact			Occupational impact in remaining industry			Total impact		
	Base scenario	High scenario	Low scenario	Base scenario	High scenario	Low scenario	Base scenario	High scenario	Low scenario
4984 Florists	19.5	19.6	19.4	0.0	0.0	0.0	19.5	19.6	19.4
4985 Fire Fighters	0.1	0.2	0.1	21.7	26.4	17.0	21.8	26.6	17.1
4986 Drillers	0.5	0.6	0.4	2.1	2.4	1.7	2.6	3.0	2.1
4987 Chemical, Petroleum and Gas Plant Operators	0.7	0.7	0.7	0.0	0.0	0.0	0.7	0.7	0.7
4988 Power Generation Plant Operators	0.2	0.2	0.2	1.0	1.2	0.8	1.2	1.4	0.9
4991 Defence Force Members Not Elsewhere Included	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0
4992 Performing Arts Support Workers	2.6	3.4	1.8	21.0	25.0	17.0	23.7	28.4	18.8
4999 Other Miscellaneous Tradespersons and Related Workers	0.8	0.9	0.6	8.9	9.2	8.6	9.7	10.1	9.2
5111 Secretaries and Personal Assistants	5.3	6.6	4.0	6.9	6.6	7.2	12.2	13.2	11.2
5911 Bookkeepers	4.4	5.4	3.4	0.0	0.0	0.0	4.4	5.4	3.4
5912 Credit and Loans Officers	10.4	11.7	9.0	14.8	16.9	12.7	25.2	28.6	21.8
5991 Advanced Legal and Related Clerks	12.3	15.7	8.9	15.5	17.4	13.3	27.7	33.1	22.2
5992 Court and Hansard Reporters	2.6	3.1	2.1	0.0	0.0	0.0	2.6	3.1	2.1
5993 Insurance Agents	12.1	15.0	9.2	20.9	24.8	16.8	33.1	39.8	26.0
5994 Insurance Risk Surveyors, Investigators and Loss Adjusters	11.7	14.6	8.9	0.0	0.0	0.0	11.7	14.6	8.9
5995 Desktop Publishing Operators	2.2	2.8	1.7	0.0	0.0	0.0	2.2	2.8	1.7
5996 Travel Attendants	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1
5999 Other Miscellaneous Advanced Clerical and Service Workers	3.0	3.5	2.4	12.9	13.7	12.0	15.8	17.2	14.5
6111 General Clerks	3.0	3.7	2.3	13.9	16.1	11.8	16.9	19.8	14.1
6121 Keyboard Operators	5.3	6.7	3.9	24.1	29.9	18.0	29.4	36.6	21.9
6131 Receptionists	2.5	3.1	1.9	0.0	0.0	0.0	2.5	3.1	1.9
6141 Accounting Clerks	4.1	5.0	3.2	17.7	21.7	13.7	21.8	26.7	16.9
6142 Payroll Clerks	3.0	3.7	2.3	18.3	22.3	14.2	21.3	26.0	16.4
6143 Bank Workers	11.4	12.6	10.2	23.5	28.9	18.0	34.9	41.4	28.2
6144 Insurance Clerks	9.3	11.5	7.1	0.0	0.0	0.0	9.3	11.5	7.1
6145 Money Market and Statistical Clerks	6.1	7.9	4.4	0.0	0.0	0.0	6.1	7.9	4.4
6151 Production Recording Clerks	2.3	2.8	1.8	11.5	14.2	8.8	13.8	17.0	10.6
6152 Transport and Despatching Clerks	2.4	2.8	2.1	9.7	10.5	8.9	12.1	13.3	11.0

Table 6.1 Per cent of service industry occupations from Off-shoring over the next two decades – occupations and industry Off-shoring combined (continued)

	Industry impact			Occupational impact in remaining industry			Total impact		
	Base scenario	High scenario	Low scenario	Base scenario	High scenario	Low scenario	Base scenario	High scenario	Low scenario
6153 Stock and Purchasing Clerks	3.8	4.4	3.3	14.6	17.4	11.7	18.4	21.8	15.0
6191 Inquiry and Admissions Clerks	7.0	9.1	4.9	3.4	1.3	5.6	10.4	10.4	10.5
6192 Library Assistants	5.7	6.8	4.7	0.0	0.0	0.0	5.7	6.8	4.7
6193 Personnel Clerks	3.9	4.9	3.0	6.5	5.6	7.5	10.5	10.5	10.5
6194 Intermediate Inspectors and Examiners	0.6	0.8	0.5	4.8	2.7	6.9	5.4	3.5	7.4
6199 Other Intermediate Clerical Workers	4.7	5.7	3.7	5.9	4.6	7.1	10.5	10.3	10.8
6211 Sales Representatives	6.0	6.8	5.2	3.7	2.0	5.5	9.7	8.8	10.7
6212 Motor Vehicle and Related Products Salespersons	2.9	2.5	3.3	0.0	0.0	0.0	2.9	2.5	3.3
6213 Retail and Checkout Supervisors	0.5	0.6	0.5	0.0	0.0	0.0	0.5	0.6	0.5
6311 Education Aides	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6312 Children's Care Workers	0.2	0.2	0.2	0.0	0.0	0.0	0.2	0.2	0.2
6313 Special Care Workers	0.2	0.3	0.2	0.0	0.0	0.0	0.2	0.3	0.2
6314 Personal Care and Nursing Assistants	0.2	0.2	0.2	0.0	0.0	0.0	0.2	0.2	0.2
6321 Hotel Service Supervisors	0.2	0.2	0.2	3.5	4.2	2.8	3.7	4.5	3.0
6322 Bar Attendants	0.1	0.2	0.1	0.0	0.0	0.0	0.1	0.2	0.1
6323 Waiters	0.2	0.3	0.2	0.0	0.0	0.0	0.2	0.3	0.2
6324 Hospitality Trainees	0.2	0.2	0.1	0.0	0.0	0.0	0.2	0.2	0.1
6391 Dental Assistants	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.0
6392 Veterinary Nurses	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6393 Prison Officers	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1
6394 Gaming Workers	0.1	0.1	0.1	23.4	28.5	18.2	23.5	28.6	18.3
6395 Personal Care Consultants	0.2	0.3	0.2	0.0	0.0	0.0	0.2	0.3	0.2
6396 Fitness Instructors and Related Workers	0.3	0.3	0.2	0.0	0.0	0.0	0.3	0.3	0.2
6397 Travel and Tourism Agents	0.4	0.5	0.3	21.9	26.5	17.3	22.3	27.0	17.6
6399 Other Intermediate Service Workers	0.4	0.5	0.3	0.0	0.0	0.0	0.4	0.5	0.3
7111 Mobile Construction Plant Operators	0.5	0.6	0.5	0.0	0.0	0.0	0.5	0.6	0.5
7112 Forklift Drivers	2.6	2.8	2.4	0.0	0.0	0.0	2.6	2.8	2.4
7119 Other Mobile Plant Operators	0.3	0.4	0.3	0.0	0.0	0.0	0.3	0.4	0.3
7121 Engine and Boiler Operators	0.4	0.4	0.4	0.0	0.0	0.0	0.4	0.4	0.4
7122 Crane, Hoist and Lift Operators	0.8	0.9	0.7	0.0	0.0	0.0	0.8	0.9	0.7
7123 Engineering Production Systems Workers	0.4	0.4	0.4	0.0	0.0	0.0	0.4	0.4	0.4

Table 6.1 Per cent of service industry occupations from Off-shoring over the next two decades – occupations and industry Off-shoring combined (continued)

	Industry impact			Occupational impact in remaining industry			Total impact		
	Base scenario	High scenario	Low scenario	Base scenario	High scenario	Low scenario	Base scenario	High scenario	Low scenario
7124 Pulp and Paper Mill Operators	0.8	1.0	0.7	0.9	0.9	0.9	1.7	1.9	1.6
7129 Other Intermediate Stationary Plant Operators	0.7	0.8	0.7	0.0	0.0	0.0	0.7	0.8	0.7
7211 Sewing Machinists	0.5	0.6	0.4	0.4	0.4	0.3	0.9	1.0	0.7
7212 Textile and Footwear Production Machine Operators	0.4	0.4	0.3	0.3	0.1	0.5	0.7	0.5	0.8
7291 Plastics Production Machine Operators	0.5	0.5	0.4	0.3	0.1	0.4	0.8	0.7	0.9
7292 Rubber Production Machine Operators	0.7	0.7	0.8	0.5	0.3	0.7	1.2	0.9	1.5
7293 Chemical Production Machine Operators	0.6	0.7	0.5	0.4	0.3	0.6	1.0	0.9	1.1
7294 Wood Processing Machine Operators	0.9	0.8	1.0	0.0	0.0	0.0	0.9	0.8	1.0
7295 Paper Products Machine Operators	0.8	0.9	0.7	0.5	0.3	0.7	1.3	1.2	1.4
7296 Glass Production Machine Operators	0.2	0.2	0.3	0.0	0.0	0.0	0.2	0.2	0.3
7297 Clay, Stone and Concrete Processing Machine Operators	0.8	0.8	0.8	0.4	0.1	0.6	1.1	0.9	1.4
7298 Photographic Developers and Printers	1.5	2.0	1.1	1.3	1.5	1.0	2.8	3.6	2.1
7299 Other Intermediate Machine Operators	0.9	1.0	0.8	0.4	0.5	0.3	1.4	1.6	1.2
7311 Truck Drivers	1.1	1.1	1.1	0.0	0.0	0.0	1.1	1.1	1.1
7312 Bus and Tram Drivers	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1
7313 Automobile Drivers	0.3	0.3	0.3	0.0	0.0	0.0	0.3	0.3	0.3
7314 Delivery Drivers	2.0	2.0	1.9	0.0	0.0	0.0	2.0	2.0	1.9
7315 Train Drivers and Assistants	0.2	0.2	0.2	0.0	0.0	0.0	0.2	0.2	0.2
7911 Miners	0.6	0.6	0.6	0.0	0.0	0.0	0.6	0.6	0.6
7912 Blasting Workers	0.7	0.7	0.7	0.0	0.0	0.0	0.7	0.7	0.7
7913 Structural Steel Construction Workers	1.8	2.4	1.3	0.0	0.0	0.0	1.8	2.4	1.3
7914 Insulation and Home Improvements Installers	1.1	1.1	1.0	0.0	0.0	0.0	1.1	1.1	1.0
7991 Motor Vehicle Parts and Accessories Fitters	1.1	0.9	1.3	0.0	0.0	0.0	1.1	0.9	1.3
7992 Product Quality Controllers	2.1	2.4	1.7	0.5	0.6	0.4	2.5	3.0	2.1
7993 Storepersons	3.1	3.4	2.8	0.0	0.0	0.0	3.1	3.4	2.8
7994 Seafarers and Fishing Hands	1.2	1.3	1.1	0.0	0.0	0.0	1.2	1.3	1.1
7995 Forestry and Logging Workers	0.9	0.9	0.9	0.0	0.0	0.0	0.9	0.9	0.9
7996 Printing Hands	0.6	0.8	0.5	0.0	0.0	0.0	0.6	0.8	0.5
8111 Registry and Filing Clerks	4.1	5.1	3.1	12.1	13.3	10.9	16.2	18.4	13.9
8112 Mail Sorting Clerks	1.4	1.7	1.1	0.0	0.0	0.0	1.4	1.7	1.1

Table 6.1 Per cent of service industry occupations from Off-shoring over the next two decades – occupations and industry Off-shoring combined (continued)

	Industry impact			Occupational impact in remaining industry			Total impact		
	Base scenario	High scenario	Low scenario	Base scenario	High scenario	Low scenario	Base scenario	High scenario	Low scenario
8113 Switchboard Operators	6.6	8.7	4.5	32.0	40.2	23.2	38.5	48.9	27.7
8114 Messengers	0.3	0.4	0.3	0.0	0.0	0.0	0.3	0.4	0.3
8115 Betting Clerks	0.5	0.7	0.4	0.0	0.0	0.0	0.5	0.7	0.4
8116 Office Trainees	4.0	5.0	3.1	19.1	22.9	15.2	23.1	27.9	18.3
8119 Other Elementary Clerks	5.4	6.8	4.0	14.4	15.3	13.4	19.8	22.2	17.3
8211 Sales Assistants	1.1	1.3	0.8	0.0	0.0	0.0	1.1	1.3	0.8
8291 Checkout Operators and Cashiers	0.3	0.3	0.3	0.0	0.0	0.0	0.3	0.3	0.3
8292 Ticket Salespersons	1.7	2.2	1.1	15.6	17.7	13.5	17.3	19.9	14.6
8293 Street Vendors and Related Workers	2.4	2.6	2.1	0.0	0.0	0.0	2.4	2.6	2.1
8294 Telemarketers	6.2	7.7	4.8	40.0	51.6	28.0	46.3	59.3	32.8
8295 Sales Demonstrators and Models	7.9	8.8	7.0	9.2	7.1	11.3	17.1	15.9	18.3
8296 Service Station Attendants	0.2	0.2	0.3	0.0	0.0	0.0	0.2	0.2	0.3
8297 Sales and Service Trainees	1.3	1.5	1.1	0.0	0.0	0.0	1.3	1.5	1.1
8299 Other Elementary Sales Workers	5.8	6.0	5.5	0.0	0.0	0.0	5.8	6.0	5.5
8311 Guards and Security Officers	0.5	0.6	0.4	0.0	0.0	0.0	0.5	0.6	0.4
8312 Ushers, Porters and Related Workers	0.6	0.8	0.5	0.0	0.0	0.0	0.6	0.8	0.5
8313 Domestic Housekeepers	0.5	0.6	0.4	0.0	0.0	0.0	0.5	0.6	0.4
8314 Caretakers	0.8	1.0	0.7	0.0	0.0	0.0	0.8	1.0	0.7
8315 Laundry Workers	0.2	0.3	0.2	0.0	0.0	0.0	0.2	0.3	0.2
8319 Other Elementary Service Workers	2.3	2.6	2.0	22.0	26.5	17.4	24.3	29.1	19.4
9111 Cleaners	0.6	0.7	0.5	0.0	0.0	0.0	0.6	0.7	0.5
9211 Engineering Production Process Workers	0.5	0.6	0.5	0.0	0.0	0.0	0.5	0.6	0.5
9212 Product Assemblers	0.7	0.8	0.6	0.0	0.0	0.0	0.7	0.8	0.6
9213 Meat and Fish Process Workers	2.8	2.6	3.1	0.0	0.0	0.0	2.8	2.6	3.1
9214 Other Food Factory Hands	0.9	0.9	0.9	0.0	0.0	0.0	0.9	0.9	0.9
9215 Wood Products Factory Hands	1.2	1.0	1.3	0.0	0.0	0.0	1.2	1.0	1.3
9219 Other Process Workers	0.9	1.0	0.8	0.0	0.0	0.0	0.9	1.0	0.8
9221 Hand Packers	2.4	2.6	2.2	0.0	0.0	0.0	2.4	2.6	2.2
9222 Packagers and Container Fillers	1.4	1.6	1.3	0.0	0.0	0.0	1.4	1.6	1.3
9911 Mining Support Workers and Driller's Assistants	0.8	0.8	0.7	0.0	0.0	0.0	0.8	0.8	0.7
9912 Earthmoving Labourers	2.0	2.5	1.5	0.0	0.0	0.0	2.0	2.5	1.5

Table 6.1 Per cent of service industry occupations from Off-shoring over the next two decades – occupations and industry Off-shoring combined (continued)

	Industry impact			Occupational impact in remaining industry			Total impact		
	Base scenario	High scenario	Low scenario	Base scenario	High scenario	Low scenario	Base scenario	High scenario	Low scenario
9913 Paving and Surfacing Labourers	0.2	0.2	0.2	0.0	0.0	0.0	0.2	0.2	0.2
9914 Survey Hands	0.8	1.1	0.6	0.0	0.0	0.0	0.8	1.1	0.6
9915 Railway Labourers	0.2	0.2	0.2	0.0	0.0	0.0	0.2	0.2	0.2
9916 Construction and Plumber's Assistants	0.8	0.9	0.7	0.0	0.0	0.0	0.8	0.9	0.7
9917 Concreters	0.3	0.4	0.3	0.0	0.0	0.0	0.3	0.4	0.3
9918 Electrical and Telecommunications Trades Assistants	2.5	3.4	1.7	0.0	0.0	0.0	2.5	3.4	1.7
9919 Other Mining, Construction and Related Labourers	0.4	0.4	0.3	0.0	0.0	0.0	0.4	0.4	0.3
9921 Farm Hands	0.6	0.7	0.6	0.0	0.0	0.0	0.6	0.7	0.6
9922 Nursery and Garden Labourers	0.5	0.5	0.4	0.0	0.0	0.0	0.5	0.5	0.4
9929 Other Agricultural and Horticultural Labourers	0.8	0.8	0.7	0.0	0.0	0.0	0.8	0.8	0.7
9931 Kitchenhands	0.2	0.2	0.2	0.0	0.0	0.0	0.2	0.2	0.2
9932 Fast Food Cooks	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9933 Food Trades Assistants	0.6	0.5	0.7	0.0	0.0	0.0	0.6	0.5	0.7
9991 Garbage Collectors	0.3	0.4	0.3	0.0	0.0	0.0	0.3	0.4	0.3
9992 Freight and Furniture Handlers	1.8	1.8	1.7	0.0	0.0	0.0	1.8	1.8	1.7
9993 Handypersons	0.8	0.9	0.6	0.0	0.0	0.0	0.8	0.9	0.6
9999 Other Miscellaneous Labourers and Related Workers	1.4	1.6	1.3	0.0	0.0	0.0	1.4	1.6	1.3
Total (of service sector employment)	**3.2**	**3.9**	**2.5**	**6.5**	**7.5**	**5.5**	**9.7**	**11.4**	**8.0**
Per cent of total employment	2.7	3.3	2.1	5.5	6.3	4.7	8.2	9.7	6.8
Total – 2006 (number)	**279706.9**	**344069.1**	**215344.8**	**569939.0**	**653495.0**	**481095.6**	**849645.9**	**997564.0**	**696440.4**

Table 6.2 Number of employment by four digit ASCO occupations lost from Off-shoring over next two decades – based on occupational employment levels 2006 – total impact

	Base scenario ('000)	High scenario ('000)	Low scenario ('000)	Base scenario (% of total)	High scenario (% of total)	Low scenario (% of total)
1111 Legislators and Government Appointed Officials	0.0	0.0	0.0	0.0	0.0	0.0
1112 General Managers	11.4	12.5	10.2	1.3	1.3	1.5
1191 Building and Construction Managers	0.2	0.3	0.2	0.0	0.0	0.0
1192 Importers, Exporters and Wholesalers	6.1	7.1	5.2	0.7	0.7	0.7
1193 Manufacturers	0.2	0.2	0.2	0.0	0.0	0.0
1211 Finance Managers	10.7	12.6	8.7	1.3	1.3	1.2
1212 Company Secretaries	0.1	0.1	0.1	0.0	0.0	0.0
1213 Human Resource Managers	6.9	8.2	5.6	0.8	0.8	0.8
1221 Engineering Managers	1.0	1.1	0.9	0.1	0.1	0.1
1222 Production Managers	1.5	1.4	1.5	0.2	0.1	0.2
1223 Supply and Distribution Managers	5.6	6.8	4.4	0.7	0.7	0.6
1224 Information Technology Managers	15.2	18.9	11.2	1.8	1.9	1.6
1231 Sales and Marketing Managers	25.9	30.6	21.1	3.0	3.1	3.0
1291 Policy and Planning Managers	3.8	4.5	3.0	0.4	0.5	0.4
1292 Health Services Managers	0.4	0.4	0.3	0.0	0.0	0.0
1293 Education Managers	0.1	0.1	0.0	0.0	0.0	0.0
1294 Commissioned Officers (Management)	0.0	0.0	0.0	0.0	0.0	0.0
1295 Child Care Co-Ordinators	0.2	0.2	0.1	0.0	0.0	0.0
1296 Media Producers and Artistic Directors	1.9	2.3	1.5	0.2	0.2	0.2
1299 Other Specialist Managers	4.8	5.4	4.3	0.6	0.5	0.6
1311 Mixed Crop and Livestock Farmers	0.0	0.0	0.0	0.0	0.0	0.0
1312 Livestock Farmers	0.1	0.1	0.1	0.0	0.0	0.0
1313 Crop Farmers	0.3	0.3	0.2	0.0	0.0	0.0
1314 Aquaculture Farmers	0.0	0.0	0.0	0.0	0.0	0.0
2111 Chemists	1.5	1.9	1.1	0.2	0.2	0.2
2112 Geologists and Geophysicists	1.1	1.3	0.8	0.1	0.1	0.1
2113 Life Scientists	3.9	4.9	2.8	0.5	0.5	0.4
2114 Environmental and Agricultural Science Professionals	1.4	1.7	1.0	0.2	0.2	0.1
2115 Medical Scientists	5.3	6.5	4.1	0.6	0.6	0.6
2119 Other Natural and Physical Science Professionals	0.8	1.0	0.7	0.1	0.1	0.1

Table 6.2 Number of employment by four digit ASCO occupations lost from Off-shoring over next two decades – based on occupational employment levels 2006 – total impact (continued)

	Base scenario ('000)	High scenario ('000)	Low scenario ('000)	Base scenario (% of total)	High scenario (% of total)	Low scenario (% of total)
2121 Architects and Landscape Architects	4.0	4.8	3.2	0.5	0.5	0.5
2122 Quantity Surveyors	0.3	0.3	0.2	0.0	0.0	0.0
2123 Cartographers and Surveyors	1.3	1.4	1.2	0.2	0.1	0.2
2124 Civil Engineers	2.5	2.6	2.5	0.3	0.3	0.4
2125 Electrical and Electronics Engineers	4.3	5.1	3.5	0.5	0.5	0.5
2126 Mechanical, Production and Plant Engineers	1.1	1.1	1.1	0.1	0.1	0.2
2127 Mining and Materials Engineers	0.1	0.1	0.1	0.0	0.0	0.0
2128 Engineering Technologists	0.1	0.1	0.0	0.0	0.0	0.0
2129 Other Building and Engineering Professionals	1.6	1.7	1.4	0.2	0.2	0.2
2211 Accountants	34.3	40.1	28.4	4.0	4.0	4.1
2212 Auditors	0.6	0.8	0.5	0.1	0.1	0.1
2213 Corporate Treasurers	0.6	0.7	0.4	0.1	0.1	0.1
2221 Marketing and Advertising Professionals	13.3	15.7	10.9	1.6	1.6	1.6
2222 Technical Sales Representatives	8.5	10.1	6.8	1.0	1.0	1.0
2231 Computing Professionals	81.2	102.1	58.4	9.6	10.2	8.4
2291 Human Resource Professionals	12.1	13.5	10.6	1.4	1.4	1.5
2292 Librarians	1.4	1.3	1.6	0.2	0.1	0.2
2293 Mathematicians, Statisticians and Actuaries	0.4	0.5	0.3	0.0	0.0	0.0
2294 Business and Organisation Analysts	7.6	8.5	6.7	0.9	0.9	1.0
2295 Property Professionals	1.9	2.1	1.8	0.2	0.2	0.3
2299 Other Business and Information Professionals	12.1	15.9	8.2	1.4	1.6	1.2
2311 Generalist Medical Practitioners	0.6	0.7	0.5	0.1	0.1	0.1
2312 Specialist Medical Practitioners	2.1	1.9	2.4	0.2	0.2	0.3
2321 Nurse Managers	0.0	0.0	0.0	0.0	0.0	0.0
2322 Nurse Educators and Researchers	0.6	0.6	0.6	0.1	0.1	0.1
2323 Registered Nurses	5.5	6.1	4.5	0.7	0.6	0.6
2324 Registered Midwives	0.0	0.0	0.0	0.0	0.0	0.0
2325 Registered Mental Health Nurses	0.0	0.0	0.0	0.0	0.0	0.0
2326 Registered Developmental Disability Nurses	0.0	0.0	0.0	0.0	0.0	0.0
2381 Dental Practitioners	0.0	0.0	0.0	0.0	0.0	0.0
2382 Pharmacists	0.1	0.1	0.1	0.0	0.0	0.0
2383 Occupational Therapists	0.0	0.1	0.0	0.0	0.0	0.0

Table 6.2 Number of employment by four digit ASCO occupations lost from Off-shoring over next two decades – based on occupational employment levels 2006 – total impact (continued)

	Base scenario ('000)	High scenario ('000)	Low scenario ('000)	Base scenario (% of total)	High scenario (% of total)	Low scenario (% of total)
2384 Optometrists	0.0	0.0	0.0	0.0	0.0	0.0
2385 Physiotherapists	0.0	0.0	0.0	0.0	0.0	0.0
2386 Speech Pathologists	0.0	0.0	0.0	0.0	0.0	0.0
2387 Chiropractors and Osteopaths	0.0	0.0	0.0	0.0	0.0	0.0
2388 Podiatrists	0.0	0.0	0.0	0.0	0.0	0.0
2391 Medical Imaging Professionals	0.0	0.0	0.0	0.0	0.0	0.0
2392 Veterinarians	0.0	0.0	0.0	0.0	0.0	0.0
2393 Dieticians	0.1	0.1	0.1	0.0	0.0	0.0
2394 Natural Therapy Professionals	0.0	0.0	0.0	0.0	0.0	0.0
2399 Other Health Professionals	0.0	0.0	0.0	0.0	0.0	0.0
2411 Pre-Primary School Teachers	0.0	0.0	0.0	0.0	0.0	0.0
2412 Primary School Teachers	0.0	0.0	0.0	0.0	0.0	0.0
2413 Secondary School Teachers	0.0	0.0	0.0	0.0	0.0	0.0
2414 Special Education Teachers	0.0	0.0	0.0	0.0	0.0	0.0
2421 University Lecturers and Tutors	8.8	10.3	7.2	1.0	1.0	1.0
2422 Vocational Education Teachers	0.9	1.0	0.7	0.1	0.1	0.1
2491 Extra-Systemic Teachers	1.1	1.3	0.8	0.1	0.1	0.1
2492 English As A Second Language Teachers	0.0	0.0	0.0	0.0	0.0	0.0
2493 Education Officers	0.5	0.6	0.4	0.1	0.1	0.1
2511 Social Workers	0.1	0.1	0.0	0.0	0.0	0.0
2512 Welfare and Community Workers	0.3	0.3	0.2	0.0	0.0	0.0
2513 Counsellors	0.9	1.1	0.7	0.1	0.1	0.1
2514 Psychologists	0.1	0.2	0.1	0.0	0.0	0.0
2515 Ministers Of Religion	0.0	0.0	0.0	0.0	0.0	0.0
2521 Legal Professionals	14.7	17.2	12.1	1.7	1.7	1.7
2522 Economists	1.0	1.2	0.8	0.1	0.1	0.1
2523 Urban and Regional Planners	0.1	0.1	0.1	0.0	0.0	0.0
2529 Other Social Professionals	1.2	1.2	1.2	0.1	0.1	0.2
2531 Visual Arts and Crafts Professionals	0.1	0.1	0.1	0.0	0.0	0.0
2532 Photographers	0.1	0.1	0.1	0.0	0.0	0.0
2533 Designers and Illustrators	16.8	21.3	12.1	2.0	2.1	1.7
2534 Journalists and Related Professionals	3.0	3.6	2.3	0.3	0.4	0.3

Table 6.2 Number of employment by four digit ASCO occupations lost from Off-shoring over next two decades – based on occupational employment levels 2006 – total impact (continued)

	Base scenario ('000)	High scenario ('000)	Low scenario ('000)	Base scenario (% of total)	High scenario (% of total)	Low scenario (% of total)
2535 Authors and Related Professionals	1.8	2.3	1.3	0.2	0.2	0.2
2536 Film, Television, Radio and Stage Directors	0.5	0.4	0.7	0.1	0.0	0.1
2537 Musicians and Related Professionals	0.1	0.1	0.1	0.0	0.0	0.0
2538 Actors, Dancers and Related Professionals	1.7	2.1	1.3	0.2	0.2	0.2
2539 Media Presenters	0.0	0.1	0.0	0.0	0.0	0.0
2541 Air Transport Professionals	5.8	7.7	3.9	0.7	0.8	0.6
2542 Sea Transport Professionals	3.2	4.1	2.3	0.4	0.4	0.3
2543 Occupational and Environmental Health Professionals	1.9	2.1	1.6	0.2	0.2	0.2
2549 Other Professionals	1.6	1.8	1.4	0.2	0.2	0.2
3111 Medical Technical Officers	1.3	1.0	1.5	0.1	0.1	0.2
3112 Science Technical Officers	0.6	0.8	0.5	0.1	0.1	0.1
3121 Building, Architectural and Surveying Associate Professionals	3.8	3.9	3.6	0.4	0.4	0.5
3122 Civil Engineering Associate Professionals	0.7	0.7	0.7	0.1	0.1	0.1
3123 Electrical Engineering Associate Professionals	0.4	0.4	0.4	0.0	0.0	0.1
3124 Electronics Engineering Associate Professionals	4.0	4.8	3.2	0.5	0.5	0.5
3125 Mechanical Engineering Associate Professionals	0.5	0.5	0.4	0.1	0.1	0.1
3129 Other Building and Engineering Associate Professionals	0.4	0.4	0.4	0.0	0.0	0.1
3211 Branch Accountants and Managers (Financial Institution)	5.6	6.2	4.9	0.7	0.6	0.7
3212 Financial Dealers and Brokers	18.2	21.9	14.5	2.1	2.2	2.1
3213 Financial Investment Advisers	8.8	10.5	7.0	1.0	1.0	1.0
3291 Office Managers	11.0	9.2	12.8	1.3	0.9	1.8
3292 Project and Program Administrators	25.2	30.9	19.4	3.0	3.1	2.8
3293 Real Estate Associate Professionals	9.5	10.3	8.8	1.1	1.0	1.3
3294 Computing Support Technicians	22.4	28.5	15.7	2.6	2.9	2.3
3311 Shop Managers	2.3	2.6	2.0	0.3	0.3	0.3
3321 Restaurant and Catering Managers	6.8	7.0	6.6	0.8	0.7	0.9
3322 Chefs	0.1	0.1	0.1	0.0	0.0	0.0
3323 Hotel and Motel Managers	0.0	0.0	0.0	0.0	0.0	0.0
3324 Club Managers (Licensed Premises)	0.0	0.0	0.0	0.0	0.0	0.0
3325 Caravan Park and Camping Ground Managers	0.0	0.0	0.0	0.0	0.0	0.0
3329 Other Hospitality and Accommodation Managers	0.0	0.0	0.0	0.0	0.0	0.0
3391 Sport and Recreation Managers	0.1	0.2	0.1	0.0	0.0	0.0

Table 6.2 Number of employment by four digit ASCO occupations lost from Off-shoring over next two decades – based on occupational employment levels 2006 – total impact (continued)

	Base scenario ('000)	High scenario ('000)	Low scenario ('000)	Base scenario (% of total)	High scenario (% of total)	Low scenario (% of total)
3392 Customer Service Managers	5.9	6.7	5.1	0.7	0.7	0.7
3393 Transport Company Managers	0.1	0.1	0.1	0.0	0.0	0.0
3399 Other Managing Supervisors (Sales and Service)	1.9	2.3	1.4	0.2	0.2	0.2
3411 Enrolled Nurses	0.1	0.1	0.1	0.0	0.0	0.0
3421 Welfare Associate Professionals	0.3	0.3	0.2	0.0	0.0	0.0
3491 Ambulance Officers and Paramedics	0.0	0.0	0.0	0.0	0.0	0.0
3492 Dental Associate Professionals	0.0	0.0	0.0	0.0	0.0	0.0
3493 Aboriginal and Torres Strait Islander Health Workers	0.0	0.0	0.0	0.0	0.0	0.0
3494 Massage Therapists	0.0	0.0	0.0	0.0	0.0	0.0
3911 Police Officers	0.0	0.0	0.0	0.0	0.0	0.0
3991 Primary Products Inspectors	0.1	0.1	0.1	0.0	0.0	0.0
3992 Safety Inspectors	0.2	0.3	0.2	0.0	0.0	0.0
3993 Sportspersons, Coaches and Related Support Workers	4.3	4.7	3.9	0.5	0.5	0.6
3994 Senior Non-Commissioned Defence Force Officers	0.0	0.0	0.0	0.0	0.0	0.0
3995 Senior Fire Fighters	0.0	0.0	0.0	0.0	0.0	0.0
3996 Retail Buyers	1.4	1.6	1.2	0.2	0.2	0.2
3997 Library Technicians	0.9	1.0	0.9	0.1	0.1	0.1
3999 Other Miscellaneous Associate Professionals	0.2	0.3	0.2	0.0	0.0	0.0
4111 General Mechanical Engineering Tradespersons	0.0	0.1	0.0	0.0	0.0	0.0
4112 Metal Fitters and Machinists	1.0	1.0	0.9	0.1	0.1	0.1
4113 Toolmakers	0.3	0.4	0.2	0.0	0.0	0.0
4114 Aircraft Maintenance Engineers	0.0	0.0	0.0	0.0	0.0	0.0
4115 Precision Metal Tradespersons	1.0	1.1	0.9	0.1	0.1	0.1
4121 General Fabrication Engineering Tradespersons	0.0	0.0	0.0	0.0	0.0	0.0
4122 Structural Steel and Welding Tradespersons	0.4	0.5	0.4	0.1	0.1	0.1
4123 Forging Tradespersons	0.2	0.3	0.2	0.0	0.0	0.0
4124 Sheetmetal Tradespersons	0.2	0.2	0.1	0.0	0.0	0.0
4125 Metal Casting Tradespersons	0.0	0.0	0.0	0.0	0.0	0.0
4126 Metal Finishing Tradespersons	0.0	0.0	0.0	0.0	0.0	0.0
4211 Motor Mechanics	0.7	0.7	0.7	0.1	0.1	0.1
4212 Automotive Electricians	0.0	0.0	0.0	0.0	0.0	0.0
4213 Panel Beaters	0.0	0.0	0.0	0.0	0.0	0.0

Table 6.2 Number of employment by four digit ASCO occupations lost from Off-shoring over next two decades – based on occupational employment levels 2006 – total impact (continued)

	Base scenario ('000)	High scenario ('000)	Low scenario ('000)	Base scenario (% of total)	High scenario (% of total)	Low scenario (% of total)
4214 Vehicle Painters	1.7	1.7	1.6	0.2	0.2	0.2
4215 Vehicle Body Makers	0.1	0.1	0.1	0.0	0.0	0.0
4216 Vehicle Trimmers	0.2	0.3	0.2	0.0	0.0	0.0
4311 Electricians	0.9	1.1	0.8	0.1	0.1	0.1
4312 Refrigeration and Airconditioning Mechanics	1.3	1.4	1.1	0.1	0.1	0.2
4313 Electrical Distribution Tradespersons	0.0	0.0	0.0	0.0	0.0	0.0
4314 Electronic Instrument Tradespersons	0.0	0.0	0.0	0.0	0.0	0.0
4315 Electronic and Office Equipment Tradespersons	9.6	11.6	7.5	1.1	1.2	1.1
4316 Communications Tradespersons	6.2	8.7	3.7	0.7	0.9	0.5
4411 Carpentry and Joinery Tradespersons	0.4	0.4	0.3	0.0	0.0	0.0
4412 Fibrous Plasterers	0.1	0.1	0.1	0.0	0.0	0.0
4413 Roof Slaters and Tilers	0.2	0.2	0.2	0.0	0.0	0.0
4414 Bricklayers	0.0	0.1	0.0	0.0	0.0	0.0
4415 Solid Plasterers	0.0	0.0	0.0	0.0	0.0	0.0
4416 Wall and Floor Tilers and Stonemasons	0.3	0.3	0.3	0.0	0.0	0.0
4421 Painters and Decorators	0.1	0.1	0.1	0.0	0.0	0.0
4422 Signwriters	0.0	0.0	0.0	0.0	0.0	0.0
4423 Floor Finishers	0.1	0.1	0.1	0.0	0.0	0.0
4431 Plumbers	0.2	0.2	0.2	0.0	0.0	0.0
4511 Meat Tradespersons	0.4	0.3	0.4	0.0	0.0	0.1
4512 Bakers and Pastrycooks	0.2	0.2	0.2	0.0	0.0	0.0
4513 Cooks	0.1	0.1	0.1	0.0	0.0	0.0
4519 Other Food Tradespersons	0.1	0.1	0.1	0.0	0.0	0.0
4611 Farm Overseers	0.0	0.0	0.0	0.0	0.0	0.0
4612 Shearers	0.0	0.0	0.0	0.0	0.0	0.0
4613 Wool, Hide and Skin Classers	0.1	0.2	0.1	0.0	0.0	0.0
4614 Animal Trainers	0.6	0.7	0.6	0.1	0.1	0.1
4621 Nurserypersons	0.5	0.5	0.4	0.1	0.1	0.1
4622 Greenkeepers	0.0	0.1	0.0	0.0	0.0	0.0
4623 Gardeners	0.3	0.3	0.2	0.0	0.0	0.0
4911 Graphic Pre-Press Tradespersons	0.3	0.4	0.2	0.0	0.0	0.0
4912 Printing Machinists and Small Offset Printers	0.1	0.1	0.1	0.0	0.0	0.0

Table 6.2 Number of employment by four digit ASCO occupations lost from Off-shoring over next two decades – based on occupational employment levels 2006 – total impact (continued)

	Base scenario ('000)	High scenario ('000)	Low scenario ('000)	Base scenario (% of total)	High scenario (% of total)	Low scenario (% of total)
4913 Binders and Finishers	0.0	0.0	0.0	0.0	0.0	0.0
4914 Screen Printers	0.0	0.0	0.0	0.0	0.0	0.0
4921 Wood Machinists and Turners	0.1	0.2	0.1	0.0	0.0	0.0
4922 Cabinetmakers	0.1	0.1	0.0	0.0	0.0	0.0
4929 Other Wood Tradespersons	0.1	0.1	0.1	0.0	0.0	0.0
4931 Hairdressers	0.0	0.0	0.0	0.0	0.0	0.0
4941 Clothing Tradespersons	1.0	1.3	0.8	0.1	0.1	0.1
4942 Upholsterers and Bedding Tradespersons	0.0	0.0	0.0	0.0	0.0	0.0
4943 Footwear Tradespersons	0.0	0.0	0.0	0.0	0.0	0.0
4944 Leather Goods, Canvas Goods and Sail Makers	0.0	0.0	0.0	0.0	0.0	0.0
4981 Marine Construction Tradespersons	0.3	0.4	0.2	0.0	0.0	0.0
4982 Glass Tradespersons	0.2	0.2	0.2	0.0	0.0	0.0
4983 Jewellers and Related Tradespersons	0.5	0.5	0.4	0.1	0.1	0.1
4984 Florists	1.6	1.6	1.6	0.2	0.2	0.2
4985 Fire Fighters	2.7	3.3	2.1	0.3	0.3	0.3
4986 Drillers	0.2	0.2	0.2	0.0	0.0	0.0
4987 Chemical, Petroleum and Gas Plant Operators	0.1	0.1	0.1	0.0	0.0	0.0
4988 Power Generation Plant Operators	0.0	0.1	0.0	0.0	0.0	0.0
4991 Defence Force Members Not Elsewhere Included	0.0	0.0	0.0	0.0	0.0	0.0
4992 Performing Arts Support Workers	4.1	4.9	3.3	0.5	0.5	0.5
4999 Other Miscellaneous Tradespersons and Related Workers	1.1	1.2	1.1	0.1	0.1	0.2
5111 Secretaries and Personal Assistants	24.5	26.4	22.5	2.9	2.7	3.2
5911 Bookkeepers	6.1	7.5	4.7	0.7	0.8	0.7
5912 Credit and Loans Officers	7.7	8.7	6.7	0.9	0.9	1.0
5991 Advanced Legal and Related Clerks	5.1	6.1	4.1	0.6	0.6	0.6
5992 Court and Hansard Reporters	0.0	0.0	0.0	0.0	0.0	0.0
5993 Insurance Agents	3.4	4.1	2.7	0.4	0.4	0.4
5994 Insurance Risk Surveyors, Investigators and Loss Adjusters	0.8	1.0	0.6	0.1	0.1	0.1
5995 Desktop Publishing Operators	0.1	0.1	0.0	0.0	0.0	0.0
5996 Travel Attendants	0.0	0.0	0.0	0.0	0.0	0.0
5999 Other Miscellaneous Advanced Clerical and Service Workers	2.2	2.4	2.1	0.3	0.2	0.3
6111 General Clerks	31.9	37.2	26.6	3.8	3.7	3.8

Table 6.2 Number of employment by four digit ASCO occupations lost from Off-shoring over next two decades – based on occupational employment levels 2006 – total impact (continued)

	Base scenario ('000)	High scenario ('000)	Low scenario ('000)	Base scenario (% of total)	High scenario (% of total)	Low scenario (% of total)
6121 Keyboard Operators	26.5	32.9	19.8	3.1	3.3	2.8
6131 Receptionists	4.6	5.7	3.5	0.5	0.6	0.5
6141 Accounting Clerks	28.0	34.2	21.7	3.3	3.4	3.1
6142 Payroll Clerks	7.5	9.2	5.8	0.9	0.9	0.8
6143 Bank Workers	23.1	27.3	18.7	2.7	2.7	2.7
6144 Insurance Clerks	2.1	2.6	1.6	0.2	0.3	0.2
6145 Money Market and Statistical Clerks	0.1	0.2	0.1	0.0	0.0	0.0
6151 Production Recording Clerks	0.5	0.6	0.4	0.1	0.1	0.1
6152 Transport and Despatching Clerks	4.6	5.0	4.2	0.5	0.5	0.6
6153 Stock and Purchasing Clerks	14.2	16.8	11.6	1.7	1.7	1.7
6191 Inquiry and Admissions Clerks	10.3	10.3	10.5	1.2	1.0	1.5
6192 Library Assistants	0.5	0.6	0.4	0.1	0.1	0.1
6193 Personnel Clerks	1.1	1.1	1.1	0.1	0.1	0.2
6194 Intermediate Inspectors and Examiners	1.8	1.1	2.4	0.2	0.1	0.3
6199 Other Intermediate Clerical Workers	2.8	2.7	2.8	0.3	0.3	0.4
6211 Sales Representatives	10.7	9.7	11.8	1.3	1.0	1.7
6212 Motor Vehicle and Related Products Salespersons	1.1	0.9	1.2	0.1	0.1	0.2
6213 Retail and Checkout Supervisors	0.2	0.2	0.2	0.0	0.0	0.0
6311 Education Aides	0.0	0.0	0.0	0.0	0.0	0.0
6312 Children's Care Workers	0.2	0.2	0.2	0.0	0.0	0.0
6313 Special Care Workers	0.2	0.2	0.2	0.0	0.0	0.0
6314 Personal Care and Nursing Assistants	0.2	0.2	0.1	0.0	0.0	0.0
6321 Hotel Service Supervisors	0.2	0.2	0.2	0.0	0.0	0.0
6322 Bar Attendants	0.1	0.1	0.1	0.0	0.0	0.0
6323 Waiters	0.3	0.3	0.2	0.0	0.0	0.0
6324 Hospitality Trainees	0.0	0.0	0.0	0.0	0.0	0.0
6391 Dental Assistants	0.0	0.0	0.0	0.0	0.0	0.0
6392 Veterinary Nurses	0.0	0.0	0.0	0.0	0.0	0.0
6393 Prison Officers	0.0	0.0	0.0	0.0	0.0	0.0
6394 Gaming Workers	1.9	2.3	1.5	0.2	0.2	0.2
6395 Personal Care Consultants	0.1	0.1	0.0	0.0	0.0	0.0
6396 Fitness Instructors and Related Workers	0.1	0.1	0.1	0.0	0.0	0.0

Table 6.2 Number of employment by four digit ASCO occupations lost from Off-shoring over next two decades – based on occupational employment levels 2006 – total impact (continued)

	Base scenario ('000)	High scenario ('000)	Low scenario ('000)	Base scenario (% of total)	High scenario (% of total)	Low scenario (% of total)
6397 Travel and Tourism Agents	6.7	8.1	5.3	0.8	0.8	0.8
6399 Other Intermediate Service Workers	0.1	0.1	0.1	0.0	0.0	0.0
7111 Mobile Construction Plant Operators	0.3	0.4	0.3	0.0	0.0	0.0
7112 Forklift Drivers	1.6	1.7	1.5	0.2	0.2	0.2
7119 Other Mobile Plant Operators	0.1	0.1	0.1	0.0	0.0	0.0
7121 Engine and Boiler Operators	0.0	0.0	0.0	0.0	0.0	0.0
7122 Crane, Hoist and Lift Operators	0.1	0.1	0.1	0.0	0.0	0.0
7123 Engineering Production Systems Workers	0.1	0.2	0.1	0.0	0.0	0.0
7124 Pulp and Paper Mill Operators	0.0	0.0	0.0	0.0	0.0	0.0
7129 Other Intermediate Stationary Plant Operators	0.1	0.1	0.1	0.0	0.0	0.0
7211 Sewing Machinists	0.2	0.2	0.1	0.0	0.0	0.0
7212 Textile and Footwear Production Machine Operators	0.0	0.0	0.1	0.0	0.0	0.0
7291 Plastics Production Machine Operators	0.1	0.1	0.1	0.0	0.0	0.0
7292 Rubber Production Machine Operators	0.0	0.0	0.0	0.0	0.0	0.0
7293 Chemical Production Machine Operators	0.0	0.0	0.0	0.0	0.0	0.0
7294 Wood Processing Machine Operators	0.1	0.1	0.1	0.0	0.0	0.0
7295 Paper Products Machine Operators	0.1	0.0	0.1	0.0	0.0	0.0
7296 Glass Production Machine Operators	0.0	0.0	0.0	0.0	0.0	0.0
7297 Clay, Stone and Concrete Processing Machine Operators	0.0	0.0	0.1	0.0	0.0	0.0
7298 Photographic Developers and Printers	0.2	0.2	0.1	0.0	0.0	0.0
7299 Other Intermediate Machine Operators	0.2	0.2	0.1	0.0	0.0	0.0
7311 Truck Drivers	2.1	2.1	2.0	0.2	0.2	0.3
7312 Bus and Tram Drivers	0.0	0.0	0.0	0.0	0.0	0.0
7313 Automobile Drivers	0.1	0.1	0.1	0.0	0.0	0.0
7314 Delivery Drivers	1.6	1.6	1.6	0.2	0.2	0.2
7315 Train Drivers and Assistants	0.0	0.0	0.0	0.0	0.0	0.0
7911 Miners	0.1	0.1	0.1	0.0	0.0	0.0
7912 Blasting Workers	0.0	0.0	0.0	0.0	0.0	0.0
7913 Structural Steel Construction Workers	0.3	0.5	0.2	0.0	0.0	0.0
7914 Insulation and Home Improvements Installers	0.2	0.2	0.2	0.0	0.0	0.0
7991 Motor Vehicle Parts and Accessories Fitters	0.2	0.1	0.2	0.0	0.0	0.0
7992 Product Quality Controllers	0.5	0.6	0.4	0.1	0.1	0.1

Table 6.2 Number of employment by four digit ASCO occupations lost from Off-shoring over next two decades – based on occupational employment levels 2006 – total impact (continued)

	Base scenario ('000)	High scenario ('000)	Low scenario ('000)	Base scenario (% of total)	High scenario (% of total)	Low scenario (% of total)
7993 Storepersons	5.3	5.8	4.7	0.6	0.6	0.7
7994 Seafarers and Fishing Hands	0.1	0.1	0.1	0.0	0.0	0.0
7995 Forestry and Logging Workers	0.0	0.0	0.0	0.0	0.0	0.0
7996 Printing Hands	0.1	0.1	0.0	0.0	0.0	0.0
8111 Registry and Filing Clerks	2.6	3.0	2.3	0.3	0.3	0.3
8112 Mail Sorting Clerks	0.2	0.3	0.2	0.0	0.0	0.0
8113 Switchboard Operators	3.6	4.6	2.6	0.4	0.5	0.4
8114 Messengers	0.1	0.1	0.0	0.0	0.0	0.0
8115 Betting Clerks	0.0	0.0	0.0	0.0	0.0	0.0
8116 Office Trainees	0.8	1.0	0.6	0.1	0.1	0.1
8119 Other Elementary Clerks	2.4	2.7	2.1	0.3	0.3	0.3
8211 Sales Assistants	7.3	8.8	5.8	0.9	0.9	0.8
8291 Checkout Operators and Cashiers	0.5	0.5	0.4	0.1	0.0	0.1
8292 Ticket Salespersons	3.2	3.7	2.7	0.4	0.4	0.4
8293 Street Vendors and Related Workers	0.4	0.5	0.4	0.0	0.0	0.1
8294 Telemarketers	8.0	10.2	5.7	0.9	1.0	0.8
8295 Sales Demonstrators and Models	0.8	0.7	0.8	0.1	0.1	0.1
8296 Service Station Attendants	0.0	0.0	0.0	0.0	0.0	0.0
8297 Sales and Service Trainees	0.0	0.0	0.0	0.0	0.0	0.0
8299 Other Elementary Sales Workers	0.4	0.5	0.4	0.1	0.0	0.1
8311 Guards and Security Officers	0.3	0.3	0.2	0.0	0.0	0.0
8312 Ushers, Porters and Related Workers	0.1	0.1	0.0	0.0	0.0	0.0
8313 Domestic Housekeepers	0.0	0.0	0.0	0.0	0.0	0.0
8314 Caretakers	0.1	0.1	0.0	0.0	0.0	0.0
8315 Laundry Workers	0.0	0.1	0.0	0.0	0.0	0.0
8319 Other Elementary Service Workers	12.9	15.4	10.3	1.5	1.5	1.5
9111 Cleaners	1.5	1.7	1.3	0.2	0.2	0.2
9211 Engineering Production Process Workers	0.1	0.1	0.1	0.0	0.0	0.0
9212 Product Assemblers	0.5	0.5	0.4	0.1	0.1	0.1
9213 Meat and Fish Process Workers	0.7	0.6	0.7	0.1	0.1	0.1
9214 Other Food Factory Hands	0.3	0.3	0.2	0.0	0.0	0.0
9215 Wood Products Factory Hands	0.1	0.1	0.2	0.0	0.0	0.0

Table 6.2 Number of employment by four digit ASCO occupations lost from Off-shoring over next two decades – based on occupational employment levels 2006 – total impact (continued)

	Base scenario ('000)	High scenario ('000)	Low scenario ('000)	Base scenario (% of total)	High scenario (% of total)	Low scenario (% of total)
9219 Other Process Workers	0.2	0.2	0.2	0.0	0.0	0.0
9221 Hand Packers	1.7	1.8	1.6	0.2	0.2	0.2
9222 Packagers and Container Fillers	0.3	0.4	0.3	0.0	0.0	0.0
9911 Mining Support Workers and Driller's Assistants	0.0	0.0	0.0	0.0	0.0	0.0
9912 Earthmoving Labourers	0.1	0.1	0.1	0.0	0.0	0.0
9913 Paving and Surfacing Labourers	0.0	0.0	0.0	0.0	0.0	0.0
9914 Survey Hands	0.0	0.0	0.0	0.0	0.0	0.0
9915 Railway Labourers	0.0	0.0	0.0	0.0	0.0	0.0
9916 Construction and Plumber's Assistants	0.4	0.5	0.3	0.0	0.0	0.0
9917 Concreters	0.1	0.2	0.1	0.0	0.0	0.0
9918 Electrical and Telecommunications Trades Assistants	0.1	0.1	0.0	0.0	0.0	0.0
9919 Other Mining, Construction and Related Labourers	0.1	0.1	0.0	0.0	0.0	0.0
9921 Farm Hands	0.5	0.6	0.5	0.1	0.1	0.1
9922 Nursery and Garden Labourers	0.2	0.2	0.2	0.0	0.0	0.0
9929 Other Agricultural and Horticultural Labourers	0.0	0.0	0.0	0.0	0.0	0.0
9931 Kitchenhands	0.2	0.2	0.2	0.0	0.0	0.0
9932 Fast Food Cooks	0.0	0.0	0.0	0.0	0.0	0.0
9933 Food Trades Assistants	0.0	0.0	0.0	0.0	0.0	0.0
9991 Garbage Collectors	0.0	0.0	0.0	0.0	0.0	0.0
9992 Freight and Furniture Handlers	0.3	0.3	0.3	0.0	0.0	0.0
9993 Handypersons	0.3	0.4	0.2	0.0	0.0	0.0
9999 Other Miscellaneous Labourers and Related Workers	0.4	0.5	0.4	0.1	0.1	0.1
Total	**849.6**	**997.6**	**696.4**	**100.0**	**100.0**	**100.0**

Table 6.3	Number of employment by broad skill occupations lost from Off-shoring over next two decades – based on occupational employment levels 2006 – thousands		
	Base scenario	**High scenario**	**Low scenario**
High skilled	511.6	606.0	412.7
Intermediate skilled	272.1	315.1	228.6
Low skilled	65.9	76.4	55.2
Total	**849.6**	**997.6**	**696.4**
Per cent			
High skilled	60.2	60.7	59.3
Intermediate skilled	32.0	31.6	32.8
Low skilled	7.8	7.7	7.9
Total	**100.0**	**100.0**	**100.0**

Table 6.4	Base scenario: impact on Local Government Area employment – per cent of total employment (industry plus occupation methodology)
Albury (C)	6.3
Armidale Dumaresq (A)	6.8
Ashfield (A)	6.8
Auburn (A)	7.8
Ballina (A)	5.1
Balranald (A)	1.8
Bankstown (C)	5.0
Barraba (A)	3.8
Bathurst (C)	5.5
Baulkham Hills (A)	8.7
Bega Valley (A)	4.3
Bellingen (A)	3.7
Berrigan (A)	2.5
Bingara (A)	2.3
Blacktown (C)	5.1
Bland (A)	2.5
Blayney (A)	1.9
Blue Mountains (C)	5.3
Bogan (A)	2.9
Bombala (A)	2.3
Boorowa (A)	1.4
Botany Bay (C)	9.1
Bourke (A)	2.9
Brewarrina (A)	3.4
Broken Hill (C)	4.5
Burwood (A)	11.9
Byron (A)	4.8
Cabonne (A)	1.8
Camden (A)	4.5

Table 6.4	Base scenario: impact on Local Government Area employment – per cent of total employment (industry plus occupation methodology)
Campbelltown (C) NSW	4.6
Canterbury (C)	5.3
Carrathool (A)	1.4
Central Darling (A)	1.7
Cessnock (C)	3.7
Cobar (A)	3.0
Coffs Harbour (C)	5.5
Conargo (A)	0.5
Concord (A)	8.8
Coolah (A)	1.3
Coolamon (A)	2.1
Cooma-Monaro (A)	4.4
Coonabarabran (A)	3.2
Coonamble (A)	2.5
Cootamundra (A)	3.5
Copmanhurst (A)	2.2
Corowa (A)	2.6
Cowra (A)	3.4
Crookwell (A)	2.1
Culcairn (A)	1.8
Deniliquin (A)	3.6
Drummoyne (A)	7.0
Dubbo (C)	5.6
Dungog (A)	3.5
Eurobodalla (A)	4.4
Evans (A)	2.0
Fairfield (C)	4.8
Forbes (A)	3.3
Gilgandra (A)	2.1

Table 6.4	Base scenario: impact on Local Government Area employment – per cent of total employment (industry plus occupation methodology)
Glen Innes (A)	4.3
Gloucester (A)	2.8
Gosford (C)	5.5
Goulburn (C)	4.8
Grafton (C)	5.7
Great Lakes (A)	4.1
Greater Lithgow (C)	3.8
Greater Taree (C)	4.5
Griffith (C)	3.9
Gundagai (A)	2.2
Gunnedah (A)	3.5
Gunning (A)	1.7
Guyra (A)	1.8
Harden (A)	2.2
Hastings (A)	5.2
Hawkesbury (C)	5.0
Hay (A)	3.1
Holbrook (A)	2.0
Holroyd (C)	4.6
Hornsby (A)	6.9
Hume (A)	1.5
Hunter's Hill (A)	6.5
Hurstville (C)	7.4
Inverell (A)	3.8
Jerilderie (A)	2.6
Junee (A)	2.7
Kempsey (A)	3.9
Kiama (A)	4.3
Kogarah (A)	8.9
Ku-ring-gai (A)	9.3
Kyogle (A)	5.0
Lachlan (A)	2.3
Lake Macquarie (C)	4.6
Lane Cove (A)	13.3
Leeton (A)	3.3
Leichhardt (A)	8.9
Lismore (C)	5.9
Liverpool (C)	5.2
Lockhart (A)	2.4
Maclean (A)	4.1
Maitland (C)	4.8
Manilla (A)	2.0
Manly (A)	7.5
Marrickville (A)	6.1
Merriwa (A)	1.4
Moree Plains (A)	3.5
Mosman (A)	9.1
Mudgee (A)	3.5
Mulwaree (A)	2.2
Murray (A)	2.8
Murrumbidgee (A)	1.2
Murrurundi (A)	1.7

Table 6.4	Base scenario: impact on Local Government Area employment – per cent of total employment (industry plus occupation methodology)
Muswellbrook (A)	3.3
Nambucca (A)	3.8
Narrabri (A)	3.3
Narrandera (A)	3.0
Narromine (A)	2.8
Newcastle (C)	7.3
North Sydney (A)	18.5
Nundle (A)	1.2
Oberon (A)	2.8
Orange (C)	5.4
Parkes (A)	3.5
Parramatta (C)	9.5
Parry (A)	1.6
Penrith (C)	5.1
Pittwater (A)	6.8
Port Stephens (A)	4.8
Pristine Waters (A)	2.6
Queanbeyan (C)	4.8
Quirindi (A)	2.3
Randwick (C)	7.3
Richmond Valley (A)	3.3
Rockdale (C)	6.1
Ryde (C)	11.4
Rylstone (A)	1.8
Scone (A)	2.6
Severn (A)	1.1
Shellharbour (C)	4.5
Shoalhaven (C)	5.1
Singleton (A)	3.5
Snowy River (A)	4.1
South Sydney (C)	9.9
Strathfield (A)	6.9
Sutherland Shire (A)	5.8
Sydney (C)	17.5
Tallaganda (A)	2.7
Tamworth (C)	5.7
Temora (A)	3.0
Tenterfield (A)	2.9
Tumbarumba (A)	1.8
Tumut (A)	3.0
Tweed (A)	4.4
Unincorporated NSW	3.8
Uralla (A)	2.5
Urana (A)	1.1
Wagga Wagga (C)	5.9
Wakool (A)	1.9
Walcha (A)	2.3
Walgett (A)	2.4
Warren (A)	2.2
Warringah (A)	7.8
Waverley (A)	7.7
Weddin (A)	1.8

Table 6.4	Base scenario: impact on Local Government Area employment – per cent of total employment (industry plus occupation methodology)
Wellington (A)	3.0
Wentworth (A)	2.4
Willoughby (C)	13.9
Windouran (A)	1.9
Wingecarribee (A)	4.5
Wollondilly (A)	3.5
Wollongong (C)	6.1
Woollahra (A)	8.7
Wyong (A)	4.7
Yallaroi (A)	1.6
Yarrowlumla (A)	3.7
Yass (A)	3.0
Young (A)	3.4
Alpine (S)	3.6
Ararat (RC)	2.9
Ballarat (C)	5.8
Banyule (C)	5.9
Bass Coast (S)	3.7
Baw Baw (S)	3.6
Bayside (C)	7.1
Boroondara (C)	9.4
Brimbank (C)	4.7
Buloke (S)	2.2
Campaspe (S)	3.0
Cardinia (S)	3.3
Casey (C)	4.5
Central Goldfields (S)	3.4
Colac-Otway (S)	3.6
Corangamite (S)	1.7
Darebin (C)	6.0
Delatite (S)	3.4
East Gippsland (S)	3.9
Frankston (C)	5.3
Gannawarra (S)	2.4
Glen Eira (C)	7.7
Glenelg (S)	2.8
Golden Plains (S)	2.3
Greater Bendigo (C)	5.9
Greater Dandenong (C)	5.4
Greater Geelong (C)	5.2
Greater Shepparton (C)	4.2
Hepburn (S)	3.7
Hindmarsh (S)	2.2
Hobsons Bay (C)	4.3
Horsham (RC)	5.1
Hume (C)	5.1
Indigo (S)	2.9
Kingston (C)	5.4
Knox (C)	5.8
La Trobe (S)	4.9
Loddon (S)	1.5
Macedon Ranges (S)	4.2

Table 6.4	Base scenario: impact on Local Government Area employment – per cent of total employment (industry plus occupation methodology)
Manningham (C)	6.5
Maribyrnong (C)	5.7
Maroondah (C)	5.3
Melbourne (C)	15.5
Melton (S)	3.9
Mildura (RC)	4.1
Mitchell (S)	4.2
Moira (S)	2.4
Monash (C)	8.1
Moonee Valley (C)	6.7
Moorabool (S)	3.5
Moreland (C)	5.2
Mornington Peninsula (S)	4.4
Mount Alexander (S)	3.2
Moyne (S)	1.4
Murrindindi (S)	3.2
Nillumbik (S)	5.2
Northern Grampians (S)	2.8
Port Phillip (C)	13.0
Pyrenees (S)	1.7
Queenscliffe (B)	6.0
South Gippsland (S)	2.8
Southern Grampians (S)	3.4
Stonnington (C)	8.6
Strathbogie (S)	2.3
Surf Coast (S)	4.0
Swan Hill (RC)	3.4
Towong (S)	2.1
Unincorporated Vic	1.1
Wangaratta (RC)	3.7
Warrnambool (C)	5.1
Wellington (S)	3.6
West Wimmera (S)	1.4
Whitehorse (C)	9.0
Whittlesea (C)	3.9
Wodonga (RC)	5.0
Wyndham (C)	4.9
Yarra (C)	9.4
Yarra Ranges (S)	4.2
Yarriambiack (S)	1.9
Aramac (S)	2.2
Atherton (S)	4.3
Aurukun (S)	6.8
Balonne (S)	2.0
Banana (S)	2.5
Barcaldine (S)	3.4
Barcoo (S)	4.3
Bauhinia (S)	1.2
Beaudesert (S)	4.0
Belyando (S)	2.3
Bendemere (S)	1.2
Biggenden (S)	2.7

Table 6.4	Base scenario: impact on Local Government Area employment – per cent of total employment (industry plus occupation methodology)
Blackall (S)	2.3
Boonah (S)	2.8
Booringa (S)	2.6
Boulia (S)	3.1
Bowen (S)	2.8
Brisbane (C)	8.8
Broadsound (S)	2.7
Bulloo (S)	4.4
Bundaberg (C)	4.7
Bungil (S)	6.5
Burdekin (S)	2.5
Burke (S)	4.0
Burnett (S)	2.4
Caboolture (S)	3.9
Cairns (C)	6.4
Calliope (S)	3.4
Caloundra (C)	4.6
Cambooya (S)	1.8
Cardwell (S)	2.4
Carpentaria (S)	4.6
Charters Towers (C)	3.3
Chinchilla (S)	2.8
Clifton (S)	1.2
Cloncurry (S)	2.2
Cook (S)	4.0
Cooloola (S)	3.8
Crow's Nest (S)	3.7
Croydon (S)	4.2
Dalby (T)	4.1
Dalrymple (S)	3.5
Diamantina (S)	2.0
Douglas (S)	4.8
Duaringa (S)	2.4
Eacham (S)	3.0
Eidsvold (S)	1.1
Emerald (S)	4.0
Esk (S)	2.8
Etheridge (S)	3.7
Fitzroy (S)	2.7
Flinders (S)	2.8
Gatton (S)	3.8
Gayndah (S)	2.6
Gladstone (C)	5.1
Gold Coast (C)	6.4
Goondiwindi (T)	3.9
Herberton (S)	4.5
Hervey Bay (C)	4.7
Hinchinbrook (S)	2.6
Ilfracombe (S)	1.4
Inglewood (S)	2.0
Ipswich (C)	4.4
Isis (S)	1.9

Table 6.4	Base scenario: impact on Local Government Area employment – per cent of total employment (industry plus occupation methodology)
Isisford (S)	3.6
Jericho (S)	1.8
Johnstone (S)	3.2
Jondaryan (S)	3.7
Kilcoy (S)	2.5
Kilkivan (S)	1.8
Kingaroy (S)	4.1
Kolan (S)	1.6
Laidley (S)	2.8
Livingstone (S)	3.7
Logan (C)	5.0
Longreach (S)	4.0
Mackay (C)	5.1
Mareeba (S)	3.9
Maroochy (S)	5.6
Maryborough (C)	5.0
McKinlay (S)	2.3
Millmerran (S)	9.3
Mirani (S)	1.8
Miriam Vale (S)	2.6
Monto (S)	2.4
Mornington (S)	6.3
Mount Isa (C)	3.8
Mount Morgan (S)	3.8
Mundubbera (S)	1.5
Murgon (S)	2.9
Murilla (S)	1.9
Murweh (S)	4.3
Nanango (S)	2.2
Nebo (S)	1.8
Noosa (S)	5.4
Paroo (S)	2.8
Peak Downs (S)	1.7
Perry (S)	1.2
Pine Rivers (S)	4.7
Pittsworth (S)	2.1
Quilpie (S)	2.0
Redcliffe (C)	4.8
Redland (S)	5.0
Richmond (S)	2.4
Rockhampton (C)	5.9
Roma (T)	4.4
Rosalie (S)	1.3
Sarina (S)	3.5
Stanthorpe (S)	2.9
Tambo (S)	2.1
Tara (S)	1.1
Taroom (S)	1.6
Thuringowa (C)	4.1
Tiaro (S)	1.7
Toowoomba (C)	5.9
Torres (S)	6.5

Table 6.4	Base scenario: impact on Local Government Area employment – per cent of total employment (industry plus occupation methodology)
Townsville (C)	6.9
Waggamba (S)	0.8
Wambo (S)	1.1
Warroo (S)	2.0
Warwick (S)	3.5
Whitsunday (S)	5.2
Winton (S)	2.5
Wondai (S)	1.7
Woocoo (S)	0.9
Adelaide (C)	12.5
Adelaide Hills (DC)	4.2
Alexandrina (DC)	2.6
Barossa (DC)	3.0
Barunga West (DC)	1.2
Berri and Barmera (DC)	3.4
Burnside (C)	9.4
Campbelltown (C) SA	4.8
Ceduna (DC)	4.1
Charles Sturt (C)	5.0
Clare and Gilbert Valleys (DC)	2.9
Cleve (DC)	1.7
Coober Pedy (DC)	4.8
Copper Coast (DC)	4.2
Elliston (DC)	1.7
Flinders Ranges (DC)	2.5
Franklin Harbor (DC)	1.6
Gawler (M)	5.5
Goyder (DC)	1.4
Grant (DC)	1.0
Holdfast Bay (C)	5.2
Kangaroo Island (DC)	3.5
Karoonda East Murray (DC)	0.9
Kimba (DC)	1.7
Lacepede (DC)	2.0
Le Hunte (DC)	2.4
Light (DC)	2.7
Lower Eyre Peninsula (DC)	1.4
Loxton Waikerie (DC)	2.5
Mallala (DC)	2.3
Marion (C)	4.6
Mid Murray (DC)	2.3
Mitcham (C)	6.2
Mount Barker (DC)	4.1
Mount Gambier (C)	5.0
Mount Remarkable (DC)	1.6
Murray Bridge (RC)	3.8
Naracoorte and Lucindale (DC)	3.0
Northern Areas (DC)	2.2
Norwood Payneham St Peters (C)	8.1
Onkaparinga (C)	3.5
Orroroo/Carrieton (DC)	1.8
Peterborough (DC)	3.2

Table 6.4	Base scenario: impact on Local Government Area employment – per cent of total employment (industry plus occupation methodology)
Playford (C)	3.4
Port Adelaide Enfield (C)	4.6
Port Augusta (C)	4.7
Port Lincoln (C)	4.9
Port Pirie City and Dists (C)	3.9
Prospect (C)	6.3
Renmark Paringa (DC)	2.7
Robe (DC)	1.6
Roxby Downs (M)	2.1
Salisbury (C)	6.3
Southern Mallee (DC)	1.8
Streaky Bay (DC)	2.5
Tatiara (DC)	2.0
Tea Tree Gully (C)	4.2
The Coorong (DC)	1.9
Tumby Bay (DC)	1.5
Unincorporated SA	2.4
Unley (C)	9.1
Victor Harbor (DC)	4.2
Wakefield (DC)	2.1
Walkerville (M)	6.6
Wattle Range (DC)	1.7
West Torrens (C)	7.6
Whyalla (C)	4.1
Yankalilla (DC)	2.1
Yorke Peninsula (DC)	2.1
Albany (C)	5.0
Armadale (C)	3.9
Ashburton (S)	3.0
Augusta-Margaret River (S)	2.8
Bassendean (T)	4.9
Bayswater (C)	5.0
Belmont (C)	7.8
Beverley (S)	1.9
Boddington (S)	4.0
Boyup Brook (S)	1.5
Bridgetown-Greenbushes (S)	3.5
Brookton (S)	1.6
Broome (S)	5.6
Broomehill (S)	1.6
Bruce Rock (S)	1.8
Bunbury (C)	5.8
Busselton (S)	3.9
Cambridge (T)	6.9
Canning (C)	5.2
Capel (S)	1.9
Carnamah (S)	1.9
Carnarvon (S)	3.5
Chapman Valley (S)	1.1
Chittering (S)	2.5
Claremont (T)	6.8
Cockburn (C)	4.4

Table 6.4	Base scenario: impact on Local Government Area employment – per cent of total employment (industry plus occupation methodology)
Collie (S)	2.3
Coolgardie (S)	2.5
Coorow (S)	1.7
Corrigin (S)	2.2
Cottesloe (T)	6.9
Cranbrook (S)	3.9
Cuballing (S)	1.4
Cue (S)	1.4
Cunderdin (S)	1.6
Dalwallinu (S)	1.5
Dandaragan (S)	1.8
Dardanup (S)	2.9
Denmark (S)	2.8
Derby-West Kimberley (S)	5.0
Donnybrook-Balingup (S)	2.7
Dowerin (S)	2.0
Dumbleyung (S)	1.0
Dundas (S)	2.3
East Fremantle (T)	6.4
East Pilbara (S)	2.3
Esperance (S)	3.7
Exmouth (S)	6.8
Fremantle (C)	6.7
Geraldton (C)	5.4
Gingin (S)	2.2
Gnowangerup (S)	1.9
Goomalling (S)	1.8
Gosnells (C)	4.2
Greenough (S)	2.6
Halls Creek (S)	5.2
Harvey (S)	2.5
Irwin (S)	2.2
Jerramungup (S)	1.6
Joondalup (C)	5.8
Kalamunda (S)	4.3
Kalgoorlie/Boulder (C)	4.5
Katanning (S)	4.5
Kellerberrin (S)	2.2
Kent (S)	0.6
Kojonup (S)	1.7
Kondinin (S)	2.2
Koorda (S)	1.1
Kulin (S)	1.6
Kwinana (T)	2.7
Lake Grace (S)	1.8
Laverton (S)	2.6
Leonora (S)	1.3
Mandurah (C)	4.6
Manjimup (S)	2.9
Meekatharra (S)	2.0
Melville (C)	6.3
Menzies (S)	2.9

Table 6.4	Base scenario: impact on Local Government Area employment – per cent of total employment (industry plus occupation methodology)
Merredin (S)	4.2
Mingenew (S)	2.5
Moora (S)	2.4
Morawa (S)	0.6
Mosman Park (T)	5.0
Mount Magnet (S)	1.2
Mount Marshall (S)	0.5
Mukinbudin (S)	1.4
Mullewa (S)	2.4
Mundaring (S)	4.3
Murchison (S)	2.0
Murray (S)	1.8
Nannup (S)	2.3
Narembeen (S)	1.2
Narrogin (S)	1.3
Narrogin (T)	4.4
Nedlands (C)	7.9
Ngaanyatjarraku (S)	5.7
Northam (S)	2.2
Northam (T)	5.7
Northampton (S)	2.0
Nungarin (S)	1.8
Peppermint Grove (S)	4.2
Perenjori (S)	0.8
Perth (C)	13.4
Pingelly (S)	1.3
Plantagenet (S)	1.6
Port Hedland (T)	4.4
Quairading (S)	2.6
Ravensthorpe (S)	1.8
Rockingham (C)	4.7
Roebourne (S)	4.7
Sandstone (S)	1.8
Serpentine-Jarrahdale (S)	2.9
Shark Bay (S)	3.5
South Perth (C)	8.9
Stirling (C)	6.5
Subiaco (C)	8.7
Swan (S)	5.0
Tambellup (S)	1.8
Tammin (S)	0.6
Three Springs (S)	3.3
Toodyay (S)	3.2
Trayning (S)	1.5
Upper Gascoyne (S)	3.2
Victoria Park (T)	8.7
Victoria Plains (S)	0.8
Vincent (T)	8.3
Wagin (S)	2.7
Wandering (S)	0.8
Wanneroo (C)	3.6
Waroona (S)	1.8

Table 6.4	Base scenario: impact on Local Government Area employment – per cent of total employment (industry plus occupation methodology)
West Arthur (S)	1.1
Westonia (S)	1.1
Wickepin (S)	0.9
Williams (S)	3.9
Wiluna (S)	1.3
Wongan-Ballidu (S)	2.6
Woodanilling (S)	1.3
Wyalkatchem (S)	2.1
Wyndham-East Kimberley (S)	5.2
Yalgoo (S)	1.2
Yilgarn (S)	1.5
York (S)	2.7
Break O'Day (M)	3.1
Brighton (M)	3.4
Burnie (C)	5.6
Central Coast (M)	3.3
Central Highlands (M)	1.2
Circular Head (M)	2.5
Clarence (C)	5.0
Derwent Valley (M)	2.6
Devonport (C)	5.7
Dorset (M)	2.1
Flinders (M)	2.5
George Town (M)	2.2
Glamorgan/Spring Bay (M)	2.8
Glenorchy (C)	4.5
Hobart (C)	9.0
Huon Valley (M)	2.9

Table 6.4	Base scenario: impact on Local Government Area employment – per cent of total employment (industry plus occupation methodology)
Kentish (M)	1.9
King Island (M)	1.6
Kingborough (M)	6.8
Latrobe (M)	2.6
Launceston (C)	6.9
Meander Valley (M)	2.6
Northern Midlands (M)	3.3
Sorell (M)	3.1
Southern Midlands (M)	1.8
Tasman (M)	3.5
Waratah/Wynyard (M)	3.0
West Coast (M)	2.7
West Tamar (M)	3.6
Alice Springs (T)	6.5
Coomalie (CGC)	6.1
Darwin (C)	8.8
Jabiru (T)	4.8
Katherine (T)	5.8
Litchfield (S)	5.5
Palmerston (T)	5.5
Tennant Creek (T)	4.7
Unincorporated NT	4.9
Unincorporated ACT	10.6
Australia	**8.2**

7. Modelling the flow-on impacts of Off-shoring

The next step is to model the flow-on and offsetting responses to Off-shoring. This will be done in a number of stages so that the mechanism of adjustment is transparent.

7.1 The model framework

The model framework to analyse Off-shoring is an input-output model of the Australian economy, based on 2004-05 statistical relationships. That is, it is based on a database which involved updating the 2001-02 ABS input-output data to 2004-05, or the latest data where a full data set was available to do this. The model has:

- standard national accounts based household income and consumption formation modules;
- the cost structure of the economy determined from the price demand of the input-output relationships; and
- weighted average price and income elasticities of unity of consumer demand, export demand and import demand of activity across industries.

The model is considerably simpler than NIEIR's standard models, but it has all the structural elements to undertake an effective investigation of the issues. Secondly, simplicity of model structure allows transparency of analysis.

7.2 Occupation Off-shoring: The flow-on consumption and cost saving impacts

The potential employment losses from Off-shoring given in Table 6.1 will not incorporate the full gross employment losses. This is because there will be flow-on employment losses from the loss of expenditures by those households where income is reduced from loss of employment as a result of Off-shoring. The shock to the model is the consumption loss by industry that stems directly form the loss of income for those households which lose employment from Off-shoring.

The total employment losses by industry are given in the first three columns of Table 7.1. The employment loss includes the direct occupational employment loss from Table 6.1, translated back into the likely industry of origin using an updated 2001 based industry by occupation matrix. From Table 6.1 the total direct potential employment loss form occupation Off-shoring is 570,000 for the base case. From Table 7.1 this becomes 749,000 since the household expenditure impact is allowed for. This means that 179,000 employment positions are lost from the metropolitan flow-on effects from the direct household income loss. For the high scenario the total direct and flow-on employment loss for occupational outsourcing is 863,000.

From Table 7.2 the total loss in household consumption expenditure, or the indicator of welfare for the analysis, remains from $16.2 billion to $23 billion per annum with the base case result of $19.6 billion. These estimates are at producer prices. That is exclusive of margins and taxes.

7.3 Occupational Off-shoring: The cost reduction flow-on impact

The critical question is how much of the gross employment loss is offset by the cost reduction impact of Off-shoring. To better understand the impact on this case the fourth column in Table 7.1 is the case where the full income lost to Off-shoring in Australia represents the cost saving to domestic enterprise. That is, not the net 40 per cent cost

saving adopted for this study. That is, firms gain their off-shore services for free. This is not a trivial case as it in effect represents the case of pure technological change where employment losses represent cost savings which are fully translated into price reductions and/or increases in real incomes to those remaining in employment or receiving property income. It also would be equivalent to the case of domestic outsourcing.

From Table 7.1, the "productivity case" now reduces the employment loss from 749,000 to 32,000, or a relatively negligible amount. More importantly, from Table 7.2, there is a net gain in household consumption expenditure of $9.2 billion annually, or (28.8 minus 19.6, from Table 7.2). The additional government revenues, if expended, would more than offset the loss in employment shown in Table 7.1. That is, if the benefits of employment losses from technological change are fully passed on, in terms of cost reductions, then given plausible values for income and price elasticities of demand, the natural flow-on consequences would generate an unambiguous increase in welfare (as measured by household consumption expenditure) with the initial employment losses fully offset. Export and import elasticities greater than unity will generate larger impacts.

However, Off-shoring will involve substantial income losses to Australian households. On the 40 per cent net cost reduction case the results in Table 7.1 indicate that the employment losses from direct Off-shoring and income-consumption multiplier flow-on for occupational Off-shoring, or 749,000, is reduced to a loss of 579,000, from the fifth column of Table 7.1. That is, a gain of 169,000 in employment from the cost offset reduction effect. That is, the cost reduction effect neutralises the income-consumption multiplier impact which leaves the net employment loss equal, I total, to the direct Off-shoring employment loss.

The level of cost savings required to neutralise the living standard loss effect from Off-shoring is around 68 per cent. That is, at the level the gain in consumption from the cost reduction effect reach $19.6 billion. The reason why Australia has to reach this cost saving benchmark to neutralise the impact of Off-shoring is because, as will be seen below, Australian export performance in services is relatively poor. That is, given the current structure of the economy, little of the direct improved competitiveness benefits from Off-shoring are being translated into increased service sector exports. If the export performance of the Australian services sector could be improved, then the cost saving ratio needed to break even on welfare grounds could be significantly reduced.

Columns 6 and 7 of Table 7.1 give the high and low cases.

7.4 Industry Off-shoring: The flow-on consumption and cost saving impacts

Columns 7 to 9 in Table 7.1 duplicate the case for columns 1 to 3, except the focus is on industry Off-shoring. It will be immediately noted that the flow-on consumption impact compared to the direct impact is significantly greater compared to the case for occupational Off-shoring. For example, the total employment losses, including the consumption impact, is 538,000 when the direct impact from Table 6.1 is 279,000. This is a ratio of 2.1 compared to a ratio of 1.4 for the base case for occupational Off-shoring.

The reason for this is straight forward. For the occupational Off-shoring case the expenditure loss in the economy approximates to the total income lost per each employee displaced. For industry Off-shoring the expenditure loss is total revenue generated per employee which will be two to four times the income received by employees. That is, for industry Off-shoring the loss expands to losses of income for all factors of production, including purchases of goods and services form other industries which are combined with a unit of labour to provide this service.

However, as columns 11 to 13 indicate from Table 7.1, the relative cost savings will also be greater per employed position lost. As a result, once cost offset impacts are included, the

relativity of employment losses per industry Off-shoring vis-à-vis occupation Off-shoring is brought back into line with the direct impacts of Table 6.1.

There is a question however around the plausibility of obtaining the same cost savings for industry Off-shoring vis-à-vis occupation Off-shoring.

7.5 The total impact of Off-shoring

Table 7.2 combines the industry and occupation total Off-shoring impact by scenario. The net result is to produce estimates in line with the direct potential employment losses given in Table 6.2.

It should be noted that the analysis of this section has assumed full cost saving pass-on. The less this occurs, the closer will be the net outcome to the consumption flow-on impacts given in Table 7.1.

Table 7.1 Impact on employment from Off-shoring by flow-on component – 40 per cent net cost reduction case (number)

	Employment change including expenditure declines by households directly affected by occupational Off-shoring				Employment change including expenditure declines by households and cost reduction impacts directly from occupational Off-shoring			Flow on from direct impact of industry Off-shoring			Flow on from direct impact of industry Off-shoring and cost reduction offset		
	Base	High	Low	Productivity impact - base case	Base	High	Low	Base	High	Low	Base	High	Low
Column	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**
Sheep	-389	-457	-321	917	-25	-28	-21	-283	-349	-216	556	683	430
Grains	-496	-583	-409	1367	47	58	36	-275	-341	-209	968	1180	757
Beef cattle	-2042	-2398	-1684	3069	-820	-962	-678	-1288	-1590	-985	1255	1551	961
Dairy cattle	-810	-951	-668	1104	-371	-435	-305	-435	-541	-330	531	638	425
Pigs	-319	-375	-263	468	-133	-156	-110	-217	-268	-167	168	209	128
Poultry	-283	-333	-234	362	-139	-163	-115	-170	-210	-130	120	149	92
Other agriculture	-3545	-4162	-2923	4247	-1854	-2175	-1530	-1930	-2393	-1468	1445	1771	1124
Services to agriculture; hunting and trapping	-462	-543	-381	772	-155	-182	-128	-313	-391	-235	349	425	274
Forestry and logging	-126	-148	-104	350	14	16	11	-132	-165	-99	168	204	132
Commercial fishing	-566	-664	-467	676	-297	-348	-245	-296	-367	-225	254	308	200
Coal	-50	-59	-42	323	78	91	64	-65	-81	-49	200	246	154
Oil and gas	-31	-37	-26	78	0	0	0	-37	-45	-29	27	34	21
Iron ores	-12	-14	-10	102	29	34	24	-15	-19	-12	79	98	61
Non-ferrous metal ores	-32	-37	-26	499	166	195	137	-41	-51	-32	438	541	336
Other mining	-70	-82	-57	243	27	32	22	-66	-82	-50	151	186	116
Services to mining	-26	-31	-22	258	76	89	63	-32	-40	-25	216	271	161
Meat and meat products	-1187	-1394	-979	1701	-510	-598	-421	-736	-910	-563	654	809	501
Dairy products	-615	-723	-507	808	-294	-345	-242	-331	-411	-251	372	446	298
Fruit and vegetable products	-402	-472	-332	505	-201	-236	-166	-206	-255	-156	199	243	156
Oils and fats	-31	-36	-25	43	-13	-16	-11	-16	-20	-12	19	23	15
Flour mill products and cereal foods	-319	-375	-263	494	-122	-143	-101	-176	-218	-133	236	292	181
Bakery products	-1044	-1227	-861	1363	-502	-588	-414	-569	-707	-432	536	658	416
Confectionery	-212	-249	-175	241	-116	-136	-96	-104	-129	-79	89	109	69
Other food products	-649	-762	-535	1105	-209	-244	-174	-381	-472	-289	513	633	394
Soft drinks, cordials and syrups	-272	-320	-225	345	-135	-158	-112	-130	-161	-99	141	175	108

Table 7.1 Impact on employment from Off-shoring by flow-on component – 40 per cent net cost reduction case (number) – continued

	Employment change including expenditure declines by households directly affected by occupational Off-shoring				Employment change including expenditure declines by households and cost reduction impacts directly from occupational Off-shoring			Flow on from direct impact of industry Off-shoring			Flow on from direct impact of industry Off-shoring and cost reduction offset		
	Base	High	Low	Productivity impact - base case	Base	High	Low	Base	High	Low	Base	High	Low
Column	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**
Beer and malt	-170	-199	-140	236	-76	-89	-63	-86	-106	-65	104	126	82
Wine, spirits and tobacco products (a)	-259	-304	-213	396	-101	-119	-84	-148	-184	-113	169	209	130
Textile fibres, yarns and woven fabrics	-38	-44	-31	130	14	17	12	-31	-39	-24	90	111	70
Textile products	-248	-291	-204	695	29	34	23	-214	-266	-162	413	517	309
Knitting mill products	-58	-68	-48	129	-7	-8	-5	-43	-54	-32	52	64	40
Clothing	-391	-459	-322	1026	17	20	13	-326	-402	-249	552	675	430
Footwear	-44	-52	-36	117	2	3	2	-36	-46	-27	71	84	58
Leather and leather products	-11	-13	-9	110	33	38	27	-22	-25	-18	90	112	69
Sawmill products	-175	-206	-145	520	32	38	26	-169	-211	-128	278	341	217
Other wood products	-408	-480	-337	1114	35	42	28	-445	-551	-339	479	588	370
Pulp, paper and paperboard	-110	-129	-91	319	17	20	14	-206	-260	-151	61	72	51
Paper containers and products	-326	-383	-269	669	-60	-70	-50	-293	-359	-227	241	301	182
Printing and services to printing	-1286	-1510	-1060	2836	-158	-187	-128	-2077	-2583	-1571	286	352	223
Publishing; recorded media and publishing	-1250	-1468	-1031	2341	-319	-374	-264	-1759	-2201	-1317	136	161	114
Petroleum and coal products	-186	-219	-154	410	-23	-27	-19	-209	-260	-159	106	130	82
Basic chemicals	-218	-256	-180	595	18	21	15	-225	-280	-170	263	323	204
Paints	-94	-110	-77	247	4	5	4	-128	-157	-98	82	102	62
Medicinal and pharmaceutical products, pesticides	-365	-428	-301	1080	63	75	51	-281	-348	-214	632	787	480
Soap and other detergents	-78	-92	-65	161	-14	-17	-12	-104	-130	-78	29	35	24
Cosmetics and toiletry preparations	-54	-64	-45	77	-24	-28	-20	-25	-30	-19	40	49	31
Other chemical products	-67	-79	-56	232	25	29	20	-113	-141	-86	82	101	64
Rubber products	-130	-153	-107	353	10	12	9	-130	-162	-98	158	195	122

Table 7.1 Impact on employment from Off-shoring by flow-on component – 40 per cent net cost reduction case (number) – continued

	Employment change including expenditure declines by households directly affected by occupational Off-shoring				Employment change including expenditure declines by households and cost reduction impacts directly from occupational Off-shoring			Flow on from direct impact of industry Off-shoring			Flow on from direct impact of industry Off-shoring and cost reduction offset		
	Base	High	Low	Productivity impact - base case	Base	High	Low	Base	High	Low	Base	High	Low
Column	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**
Plastic products	-530	-622	-437	1281	-21	-24	-17	-630	-791	-469	478	580	378
Glass and glass products	-174	-205	-144	350	-35	-41	-29	-182	-218	-146	115	146	85
Ceramic products	-44	-52	-36	232	48	57	40	-55	-68	-42	146	181	112
Cement, lime and concrete slurry	-41	-48	-33	220	47	56	39	-61	-76	-46	132	163	101
Plaster and other concrete products	-36	-42	-30	225	54	63	44	-55	-68	-42	144	178	110
Other non-metallic mineral products	-107	-126	-88	331	25	29	20	-115	-141	-89	152	189	115
Iron and steel	-333	-391	-274	1235	158	186	131	-429	-524	-334	656	809	503
Basic non-ferrous metal and products	-54	-64	-45	546	162	190	134	-67	-83	-51	419	513	326
Structural metal products	-237	-278	-195	993	159	187	130	-253	-312	-194	551	681	421
Sheet metal products	-196	-231	-162	450	-17	-20	-14	-209	-263	-154	187	227	149
Fabricated metal products	-571	-670	-471	1744	123	144	101	-896	-1081	-711	645	808	483
Motor vehicles and parts; other transport equipment	-1568	-1841	-1293	3078	-344	-404	-281	-1278	-1579	-977	1420	1730	1114
Ships and boats	-18	-21	-15	116	28	33	22	-15	-19	-12	45	55	35
Railway equipment	-21	-25	-17	81	11	13	10	-29	-35	-22	20	25	16
Aircraft	-52	-61	-43	248	46	54	38	-111	-135	-88	61	77	46
Photographic and scientific equipment	-107	-125	-88	415	59	68	49	-132	-165	-99	148	182	114
Electronic equipment	-163	-192	-134	691	111	130	93	-371	-466	-276	344	417	272
Household appliances	-90	-106	-74	386	64	75	53	-72	-88	-55	292	363	222
Other electrical equipment	-280	-329	-231	943	95	111	79	-482	-607	-357	405	493	317
Agricultural, mining and construction machinery, lifting and material handling equipment	-194	-228	-160	798	123	144	103	-392	-466	-317	385	486	284
Other machinery and equipment	-281	-330	-232	983	110	129	91	-443	-548	-338	444	551	337
Prefabricated buildings	-8	-9	-7	55	14	16	11	-17	-22	-12	31	38	25
Furniture	-1633	-1917	-1346	2568	-610	-716	-503	-985	-1220	-750	1093	1342	845

Table 7.1 Impact on employment from Off-shoring by flow-on component – 40 per cent net cost reduction case (number) – continued

	Employment change including expenditure declines by households directly affected by occupational Off-shoring				Employment change including expenditure declines by households and cost reduction impacts directly from occupational Off-shoring			Flow on from direct impact of industry Off-shoring			Flow on from direct impact of industry Off-shoring and cost reduction offset		
	Base	High	Low	Productivity impact - base case	Base	High	Low	Base	High	Low	Base	High	Low
Column	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**
Other manufacturing	-166	-195	-137	349	-28	-32	-23	-139	-172	-106	170	208	131
Electricity supply	-548	-644	-452	1314	-26	-30	-21	-732	-909	-556	296	364	229
Gas supply	-97	-113	-80	181	-24	-29	-20	-98	-120	-75	51	63	38
Water supply; sewerage and drainage services	-578	-679	-477	879	-228	-268	-189	-643	-804	-483	63	74	54
Residential building construction	-3	-4	-3	2130	848	1004	693	-2	-2	-1	2045	2510	1579
Other construction	-94	-111	-78	3078	1136	1341	931	-198	-244	-151	2740	3430	2051
Construction trade services	-3011	-3536	-2483	12510	1975	2330	1622	-5457	-6864	-4049	5306	6502	4118
Wholesale trade	-41085	-45939	-36012	-6982	-33103	-36607	-29383	-71465	-78683	-64290	-48998	-52113	-45902
Wholesale mechanical repairs	-4528	-5213	-3806	-3343	-4445	-5116	-3738	-2302	-1981	-2627	-2123	-1760	-2490
Other wholesale repairs	-5751	-6315	-5155	-3478	-5410	-5915	-4874	-12869	-14662	-11083	-12089	-13697	-10487
Retail trade	-76811	-88305	-64977	21829	-54880	-62535	-46896	-53478	-66137	-40819	-7248	-8639	-5810
Retail mechanical repairs	-14844	-17006	-12631	10285	-8710	-9825	-7547	-8985	-11164	-6806	2624	3201	2061
Other retail repairs	-2897	-3317	-2466	1047	-2052	-2329	-1765	-815	-1010	-621	448	550	347
Accommodation, cafes and restaurants	-22248	-25970	-18459	16905	-13575	-15772	-11315	-11336	-14080	-8591	5178	6397	3979
Road transport	-12309	-13867	-10694	2205	-8800	-9757	-7788	-3631	-4494	-2769	3160	3924	2405
Rail, pipeline and other transport	-8303	-9083	-7479	-4689	-7664	-8345	-6937	-689	-845	-534	166	212	121
Water transport	-6499	-7427	-5522	-3822	-6026	-6871	-5132	-266	-335	-196	146	179	113
Air and space transport	-5306	-6045	-4528	-2209	-4583	-5197	-3930	-565	-700	-430	430	527	335
Services to transport; storage	-21488	-25864	-16898	-11920	-19719	-23769	-15455	-3634	-4462	-2805	-206	-242	-164
Communication services	-8211	-9108	-7294	4738	-5024	-5373	-4658	-44676	-61926	-27394	-35294	-49778	-20756
Finance	-75768	-89306	-61604	-29704	-66566	-78390	-54120	-62033	-72890	-51191	-43386	-50240	-36523
Ownership of dwellings	0	0	0	0	0	0	0	0	0	0	0	0	0
Other property services	-32449	-37949	-26675	-17577	-29785	-34812	-24487	-12059	-14721	-9397	-6419	-7759	-5072

Table 7.1 Impact on employment from Off-shoring by flow-on component – 40 per cent net cost reduction case (number) – continued

	Employment change including expenditure declines by households directly affected by occupational Off-shoring				Employment change including expenditure declines by households and cost reduction impacts directly from occupational Off-shoring			Flow on from direct impact of industry Off-shoring			Flow on from direct impact of industry Off-shoring and cost reduction offset		
	Base	High	Low	Productivity impact - base case	Base	High	Low	Base	High	Low	Base	High	Low
Column	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**
Scientific research, technical and computer services	-30924	-34522	-27139	-8567	-25353	-28025	-22496	-65589	-88499	-42644	-50873	-69397	-32247
Legal, accounting, marketing and business management services	-80504	-95228	-65061	-43100	-73788	-87298	-59560	-82433	-103561	-61296	-68283	-85911	-50604
Other business services	-55694	-63642	-47343	-23086	-48868	-55625	-41710	-39455	-47093	-31824	-25963	-30403	-21505
Government administration	-11451	-11508	-11379	3000	-6882	-6350	-7399	-1533	-1928	-1138	6605	8445	4769
Defence	-5655	-6625	-4634	-1868	-4583	-5347	-3768	0	0	0	836	1025	647
Education	-63433	-74574	-51764	-5086	-48351	-56594	-39587	-6430	-7985	-4875	4555	5692	3430
Health services	-68201	-77553	-57822	-5850	-51884	-58593	-44264	-4768	-5909	-3628	5423	6741	4114
Community services	-6436	-7314	-5497	1879	-4364	-4895	-3775	-1054	-1304	-803	2387	2985	1791
Motion picture, radio and television services	-6508	-7289	-5658	-1304	-5334	-5915	-4686	-2370	-3012	-1727	-196	-297	-92
Libraries, museums and the arts	-15350	-17492	-13069	-4969	-12776	-14483	-10933	-5634	-7145	-4123	-2873	-3678	-2065
Sport, gambling and recreational services	-11844	-13874	-9738	844	-9010	-10529	-7417	-3955	-4550	-3363	1363	1996	732
Personal services	-16340	-18757	-13845	4107	-11718	-13350	-10012	-3787	-4703	-2870	3119	3897	2348
Other services	-6630	-7641	-5592	4596	-4037	-4622	-3429	-2156	-2673	-1639	1656	2095	1222
Total	**-748661**	**-863363**	**-628463**	**-32476**	**-579171**	**-664403**	**-488636**	**-537831**	**-663554**	**-412108**	**-232771**	**-285350**	**-179770**

Table 7.2 Total impact on employment from Off-shoring – 40 per cent net cost reduction case			
	Base	**High**	**Low**
Sheep	531	655	409
Grains	1015	1238	794
Beef cattle	434	589	283
Dairy cattle	160	203	120
Pigs	36	54	18
Poultry	-19	-14	-23
Other agriculture	-409	-404	-406
Services to agriculture; hunting and trapping	194	243	146
Forestry and logging	181	220	144
Commercial fishing	-43	-40	-45
Coal	278	337	219
Oil and gas	27	34	21
Iron ores	108	132	84
Non-ferrous metal ores	604	736	473
Other mining	178	218	138
Services to mining	292	360	224
Meat and meat products	144	211	80
Dairy products	78	101	56
Fruit and vegetable products	-2	8	-10
Oils and fats	6	8	4
Flour mill products and cereal foods	114	149	79
Bakery products	35	70	2
Confectionery	-27	-27	-27
Other food products	304	389	221
Soft drinks, cordials and syrups	6	17	-4
Beer and malt	28	37	19
Wine, spirits and tobacco products (a)	68	90	46
Textile fibres, yarns and woven fabrics	104	127	82
Textile products	441	551	332
Knitting mill products	45	56	35
Clothing	568	695	444
Footwear	73	87	60
Leather and leather products	123	151	96
Sawmill products	310	379	243
Other wood products	514	631	398
Pulp, paper and paperboard	78	91	66
Paper containers and products	181	231	132
Printing and services to printing	128	165	96
Publishing; recorded media and publishing	-183	-213	-149
Petroleum and coal products	82	103	63
Basic chemicals	281	345	219
Paints	86	107	66
Medicinal and pharmaceutical products, pesticides	695	862	531

Table 7.2 Total impact on employment from Off-shoring – 40 per cent net cost reduction case (continued)			
	Base	**High**	**Low**
Soap and other detergents	15	18	12
Cosmetics and toiletry preparations	16	21	11
Other chemical products	107	130	84
Rubber products	169	207	131
Plastic products	458	556	361
Glass and glass products	80	105	56
Ceramic products	195	238	152
Cement, lime and concrete slurry	179	219	140
Plaster and other concrete products	198	242	154
Other non-metallic mineral products	176	218	135
Iron and steel	814	995	634
Basic non-ferrous metal and products	581	703	460
Structural metal products	710	868	552
Sheet metal products	170	206	134
Fabricated metal products	767	952	584
Motor vehicles and parts; other transport equipment	1077	1326	832
Ships and boats	72	88	57
Railway equipment	31	37	26
Aircraft	107	131	84
Photographic and scientific equipment	207	250	163
Electronic equipment	456	548	365
Household appliances	356	437	275
Other electrical equipment	500	605	396
Agricultural, mining and construction machinery, lifting and material handling equipment	508	630	387
Other machinery and equipment	553	680	428
Prefabricated buildings	45	54	36
Furniture	483	626	342
Other manufacturing	142	176	109
Electricity supply	270	334	208
Gas supply	26	35	18
Water supply; sewerage and drainage services	-165	-193	-135
Residential building construction	2893	3514	2272
Other construction	3876	4770	2981
Construction trade services	7281	8833	5740
Wholesale trade	-82101	-88720	-75285
Wholesale mechanical repairs	-6568	-6876	-6228
Other wholesale repairs	-17499	-19612	-15361
Retail trade	-62128	-71174	-52706
Retail mechanical repairs	-6086	-6624	-5486
Other retail repairs	-1604	-1779	-1418
Accommodation, cafes and restaurants	-8397	-9375	-7336
Road transport	-5639	-5833	-5383

Table 7.2 Total impact on employment from Off-shoring – 40 per cent net cost reduction case (continued)			
	Base	**High**	**Low**
Rail, pipeline and other transport	-7498	-8134	-6816
Water transport	-5881	-6692	-5019
Air and space transport	-4153	-4670	-3595
Services to transport; storage	-19925	-24012	-15620
Communication services	-40319	-55152	-25414
Finance	-109952	-128629	-90643
Ownership of dwellings	0	0	0
Other property services	-36205	-42571	-29559
Scientific research, technical and computer services	-76226	-97422	-54743
Legal, accounting, marketing and business management services	-142071	-173209	-110164
Other business services	-74831	-86029	-63215
Government administration	-276	2095	-2630
Defence	-3747	-4322	-3121
Education	-43795	-50901	-36157
Health services	-46460	-51852	-40150
Community services	-1977	-1911	-1983
Motion picture, radio and television services	-5530	-6212	-4777
Libraries, museums and the arts	-15650	-18161	-12998
Sport, gambling and recreational services	-7647	-8533	-6685
Personal services	-8599	-9453	-7665
Other services	-2381	-2528	-2207
Total	**-811942**	**-949753**	**-668406**

Table 7.3 Off-shoring – household annual consumption changes by scenario	
	40 per cent cost saving (2005 $ billion)
Occupation Off-shoring – consumption flow-on	
Base	-19.6
High	-23.0
Low	-16.2
Productivity analysis	28.8
Occupational Off-shoring – cost reduction offset	
Base	11.4
High	13.5
Low	9.4
Industry Off-shoring – consumption flow-on impact	
Base	-19.2
High	-23.7
Low	-14.6
Industry Off-shoring – cost reduction offset	
Base	20.3
High	25.0

Table 7.2	Total impact on employment from Off-shoring – 40 per cent net cost reduction case (continued)			
		Base	High	Low
	Low			15.6

Note: Consumption expenditures are at basic values. That is, net of indirect taxes less subsidies.

8. Off-shoring: The impact on the Australian distribution of income

The impact of Off-shoring on the distribution of income is complex, depending on the weights applied to the various possible responses. For example, one extreme response would be where the cost savings are returned as dividends which would, no doubt, result in a deterioration in the distribution of income.

The objective here is more limited. It is simply to take the base case and analyse the direct impact of Off-shoring on the distribution of income on the assumption that the displaced workers receive an average 25 per cent of their previous income. That is, these workers are assumed to have a marginal attachment to the workforce after displacement.

The results are given in Table 8.1. The impact on the distribution of earned income from employment and the statistics used to estimate the impact is the GINI coefficient. The results are disaggregated by the 1-digit ASCO occupational categories.

It can be seen from the table that employment losses for managers and professionals improve the distribution of income. The GINI coefficient declines by 2.7 per cent for professionals. However, for the lower skilled occupations the result is to increase the inequality of income distribution with the GINI coefficient increasing. Overall there is a net deterioration in the distribution of income with a 3.7 per cent increase in the GINI coefficient. This is largely the result of the Off-shoring job losses for the intermediate clerical sales and services workers.

Needless to say, it is not the ideal way of improving the distribution of income by removing the employment opportunities of the most skilled members of the workforce.

Table 8.1 Direct Off-shoring employment loss – base case – impact on distribution of income of employed – GINI coefficient

	Change in GINI coefficient from no Off-shoring employment loss	Per cent change in GINI coefficient from no Off-shoring employment loss
Managers and Administrators	-0.003	-0.8
Professionals	-0.010	-2.7
Associate Professionals	0.003	0.8
Tradespersons and Related Workers	0.002	0.6
Advanced Clerical and Service Workers	0.001	0.2
Intermediate Clerical, Sales and Service Workers	0.017	4.7
Intermediate Production and Transport Workers	0.001	0.2
Elementary Clerical, Sales and Service Workers	0.002	0.7
Labourers and Related Workers	0.000	0.1
Total	**0.013**	**3.7**

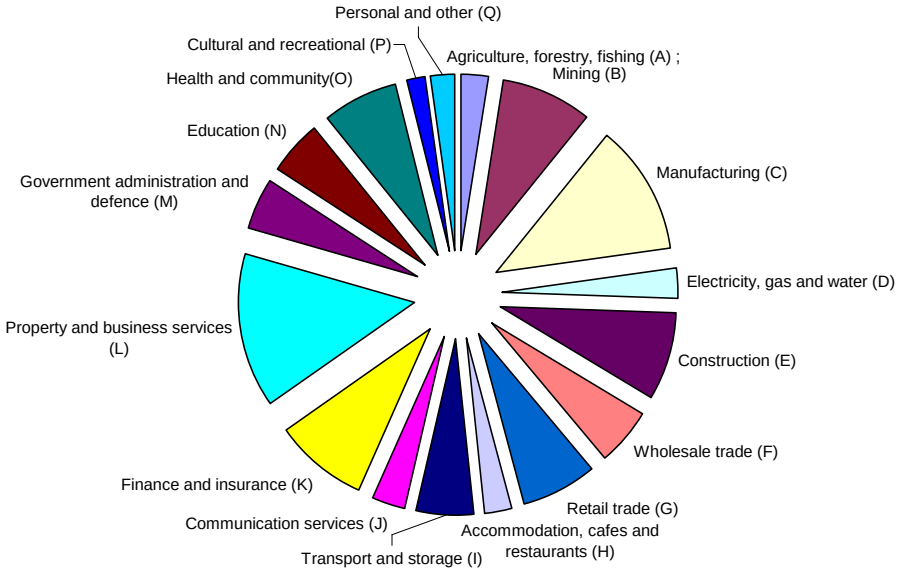
9. The Australian services industries and export performance

From the above analysis a critical factor in Australia's ability to offset the impact of Off-shoring will be the ability of the services sector to grow exports. The question is, what is the prospects of this happening given the recent performance of this sector?

In financial year 2007, the Australian services industries accounted for approximately 70 per cent of industry gross value added in the Australian economy and employed approximately 85 per cent of the Australian Labour Force. In Figure 9.1 below, the services industries are all except agriculture, mining and manufacturing (industries that produce physical goods). This study focuses in particular on industry sectors (I) to (Q) including transport (I), communication (J), finance and insurance (K) and property and business services (L).

Figure 9.1

Industry Share of Gross Value Added 2007

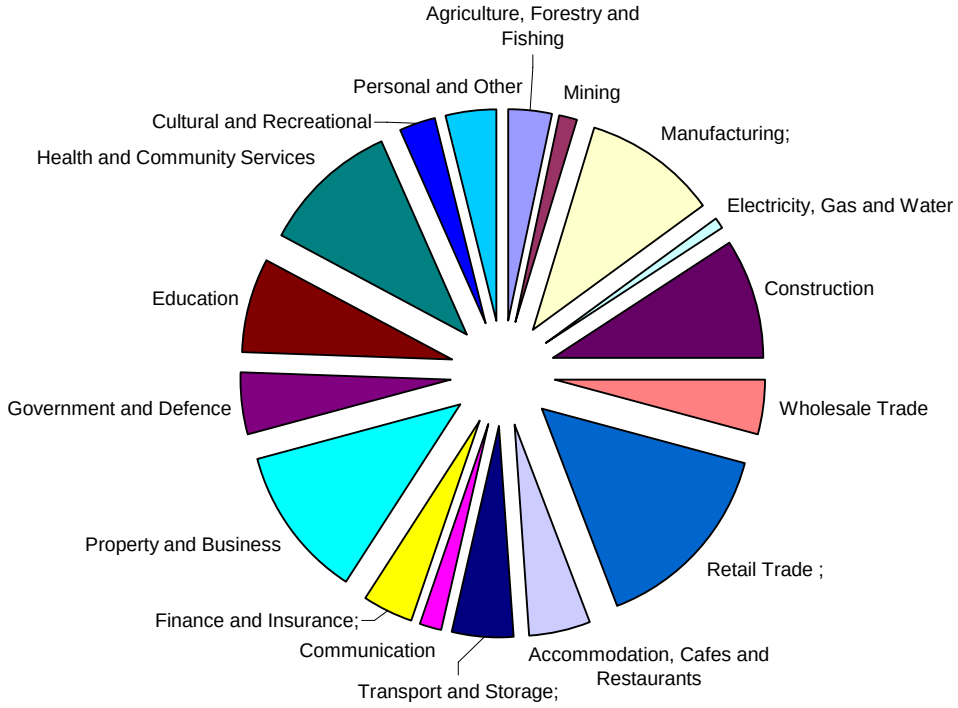


Source: **ABS Catalogue 5206.0 Table 6.**

The largest of the services sectors being examined in terms of contribution to gross value added were property and business services (12 per cent), finance and insurance (7 per cent), health (6 per cent) and transport and storage (5 per cent). In terms of employment the largest sectors are property and business services (12 per cent), health (11 per cent), education (7 per cent), government (5 per cent), transport (5 per cent) and finance and insurance (4 per cent).

Figure 9.2

Labour Force by Industry Sector November 2007

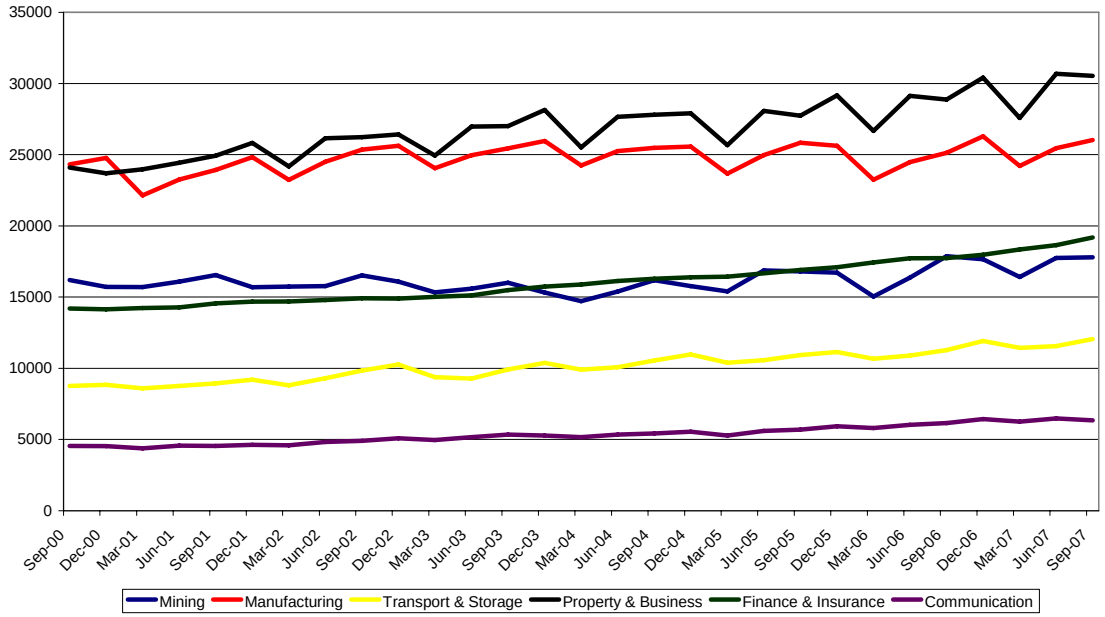


Source: ABS 6291.0.55.003 Table 04

In general, service sectors have performed well compared to other sectors in the economy with most growing at a rate above the average for the economy as a whole, the exceptions being government administration and education.

Figure 9.3

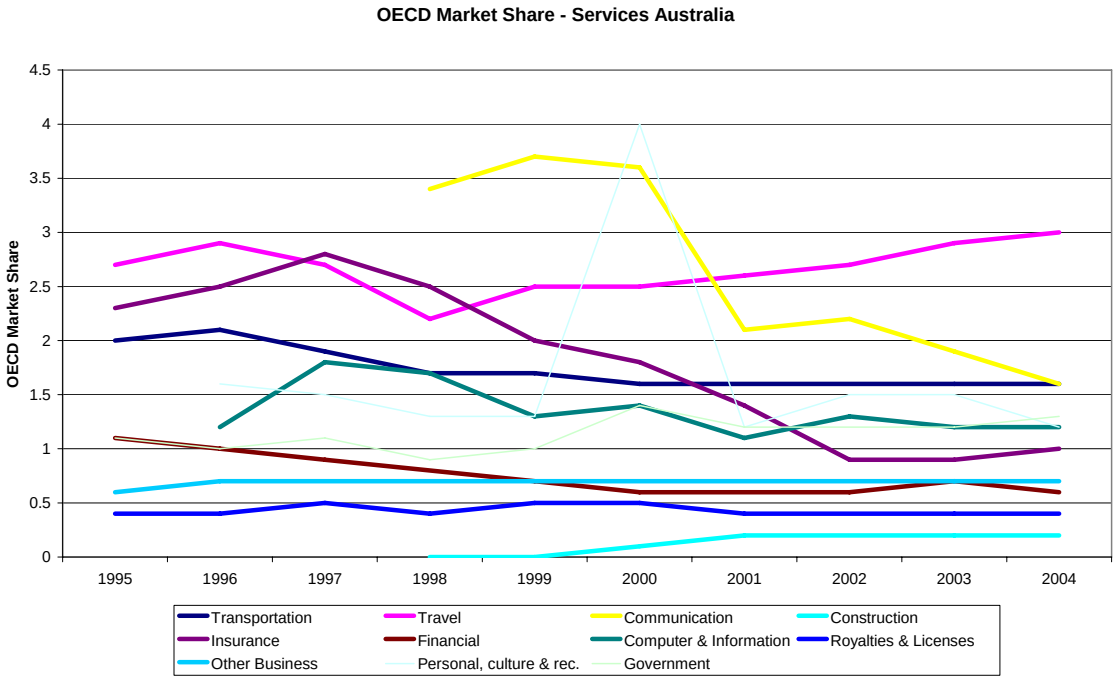
Gross Value Added Selected Industry Sectors 1999 - 2007



Source: **ABS Catalogue 5206.0 Table 6**

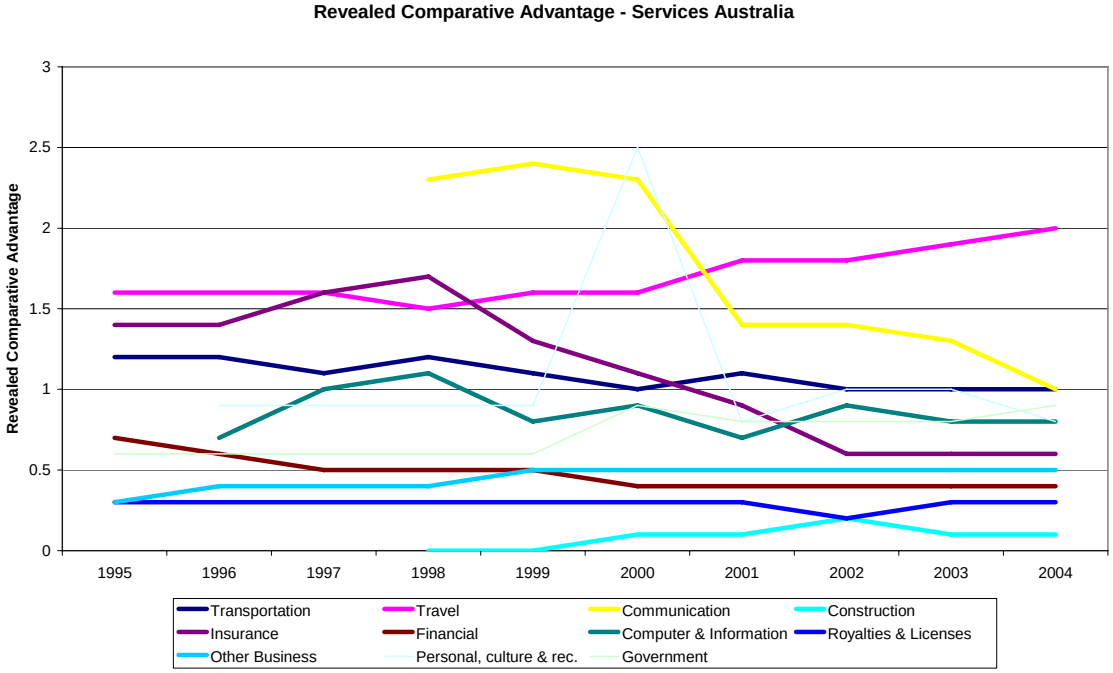
Australia's service sectors however have not performed well in terms of international competitiveness. The following figures show the performance of Australia in relation to the rest of the OECD using the measures of market share and Revealed Comparative Advantage (RCA). They show that in all sectors except travel Australian service industries have lost market share in internationally traded services.

Figure 9.4



Source: **OECD**

Figure 9.5



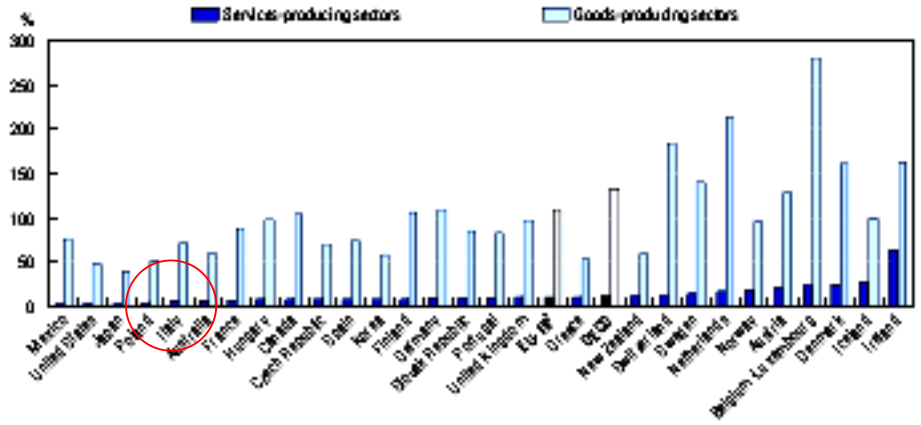
Source: **OECD**

RCA measures a good's share in a country's total exports relative to that good's share in world trade.[33] An RCA of 1 or above shows that a good or service has a relative competitive advantage in international markets. The graph above shows that Australia has a comparative advantage in travel and has lost its comparative advantage in communication and insurance services. Other service sectors have not enjoyed a comparative advantage over the past 10 years and have maintained a relatively steady position.

Australia's relatively weak position in the international trade in services is further illustrated by the following chart from a 2005 OECD report examining the international growth in traded services. Australia has one of the lowest ratios despite the fact that this report shows Australia has many of the preconditions for a successful traded services sector.

Figure 9.6

Trade to value-added ratios of the services and goods producing sectors(1), 2002 percentages



1. Average of exports and imports of goods and services as a share of value added in the goods- and services-producing sectors. The goods-producing sector includes agriculture, mining, manufacturing, electricity, gas and water; the services-producing sector covers all other industries.
2. Includes intra-EU trade; EU-19 refers to all EU countries that are also members of the OECD.

Source: IMF, Balance of Payments Statistics, OECD, STAN database and Annual National Accounts database.

Source: **OECD**

9.1 Australian service industries in a global economy

The World Trade Organisation (WTO) has identified four ways in which services are traded internationally:[34]

- cross border supply (services supplied from one country to another);
- movement of natural persons (individuals travelling from their own country to supply services in another);
- consumption abroad (movement of consumers from one country to another); and
- commercial presence (setting up subsidiaries or branches to provide services in another country).

WTO estimates the trade flows in services through each of these modes as follows.

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[33] Balassa's (1965) defined it as a country's share of world exports of a good divided by its share of total world exports. The index for country i good j is RCA ij = 100(X ij /X wj)/(X it /X wt) where X ab is exports by country a (w=world) of good b (t=total for all goods).

[34] Annex 1B, General Agreement on Trade in Services and General Agreement of Tariffs and Trade 1994 see www.wto.int.

- Cross border supply 35 per cent
- Movement of natural persons 1-2 per cent
- Consumption abroad 10-15 per cent
- Commercial presence 50 per cent

Conventional trade statistics do not capture all international trade in services particularly services delivered by foreign affiliates. However, the three broad categories examined in international services trade[35] are:

Transportation – services that involve the carriage of passengers, movement of goods and related supporting and auxiliary services;

Travel – goods and services acquired for personal use in an economy by travellers and foreign workers who stay for less than one year including business, leisure and education related travel, and;

Other commercial services. This is a broad category that includes the following.

- Communication – telecommunication, postal and courier services.
- Construction – work on construction projects and installations outside of the economic territory of the enterprise.
- Insurance - the provision of various types of insurance to non-residents by resident insurance companies.
- Financial – financial intermediary and auxiliary services between residents and non-residents.
- Computer and information – database services, data processing, hardware consultancy, maintenance and newsagency services.
- Royalties and licence fees – fees for authorised use of intellectual property.
- Other business - merchanting, leasing, legal, accounting, management consulting, public relations, advertising, market research, architectural, engineering, agricultural, mining and services between affiliated enterprises not included elsewhere.
- Personal, cultural and recreational – film, radio and television, performance fees, educational programs, welfare, cultural and recreational activities.
- Government (nie) – residual for government transactions including embassies, military units and defence agencies.

WTO estimates that services represent 20 per cent of world trade and account for about two thirds of GDP.[36] Between 1980 and 2005 world services exports increased as a proportion of world trade growing from 15 to 19 per cent of total merchandise and service exports[37]. However, from 2003 to 2006 services exports expanded less rapidly than merchandise exports[38] as globalisation of the goods manufacturing and centralisation of manufacturing in China made a major impact on trade.

Australia's performance in the context of this strong growth, as noted above, has been somewhat undistinguished. In terms of ranking, Australia is the 24th largest exporter of commercial services (12th if inter-EU trade is excluded) and 23rd largest importer (13th if inter-

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35 *Balance of Payments and International Investment Position, Australian Concepts, Sources and Methods*, Chapter 7, Australian Bureau of Statistics 1998.

36 *Measuring Trade in Services*, WTO, http://www.wto.org/English/res_e/statis_e/services_training_module_e.htm.

37 The Changing Nature of Manufacturing and Services, Irish Trends and International Context, **Forfás**, July 2006.

38 *World Trade Report*, WTO, 2007.

EU trade is excluded)[39]. Australia represents 1.17 per cent of total world services exports and 1.19 per cent of total world imports of commercial services. Internationally, services trade grew by 10 per cent between 2000 and 2006 while in Australia services trade grew by 9 per cent over the same period. Globally, 'other commercial services' is by far the largest and fastest growing category of traded services[40]. Only 25 per cent of Australia's services exports are in this category while 27 per cent of imports are in this category. More than half of Australia's services exports and a third of services imports are travel services while 20 per cent of exports and 36 per cent of imports are transportation services. A recent discussion paper by the Business Council of Australia[41] noted that:

> "*Australia's relatively poor services exports performance has come against the backdrop of remarkably strong global growth, rising demand for services around the world, and exceptional performance of some of our economic peers in capturing market share in global services.*"[42]

The paper went on to point out that Australia's share of the global services market has been shrinking at a time when Ireland's services exports, for example, grew by 23 per cent per year between 2000 and 2005. To understand this performance, the contributors to this trade performance need to be examined individually. This analysis will focus on selected 'other commercial services' groups.

Internationally, exports of 'other commercial services' doubled in value between 2000 and 2006 reaching US$1,380 billion in 2006 and accounted for half of total commercial services exported in the world. Australia does not rank in the top 15 exporters of 'other commercial services'. For Australia, over the same period, exports of 'other commercial services' rose 6 per cent to just over AU$10 billion. The largest component of 'other commercial services', both internationally (50 per cent) and in Australia (41 per cent) was 'other business services'.

9.2 Communication services

Communication services represented 5 per cent of world exports of commercial services in 2005 and grew by 10 per cent internationally between 2000 and 2005. Communication services represented 7 per cent of commercial service exports from Australia in 2005 but fell almost 50 per cent over the period from 2000 to 2005. Communication services grew most strongly in Europe (15 per cent) and relatively slowly in North America (3 per cent), Central and South America (2 per cent) and Asia (5 per cent). Australia ranked 10th as an exporter of communication services but held only 1.3 per cent of trade (USD 625) for the top 15 exporters compared with Europe 63.2 per cent, the United States (10.7 per cent) and Canada (4.6 per cent). Other countries to hold a larger share of world trade in communication services include India, Kuwait, Switzerland, Hong Kong, Romania and the Russian Federation. As an importer of communication services Australia ranked 11th with 1.4 per cent of world trade (USD 625). Australia's performance contrasts with Kuwait that almost tripled its exports of telecommunication services to $3.4 billion in 2006 by connecting an estimated 27 million mobile subscribers in neighbouring Middle Eastern countries and Sub-Saharan Africa. Kuwait is now the 4th largest exporter of telecommunication services behind the EU, US and Canada. The number of cellular mobile subscribers in the Middle East has quadrupled in the past five years. The period has also seen rapid expansion of international courier services.

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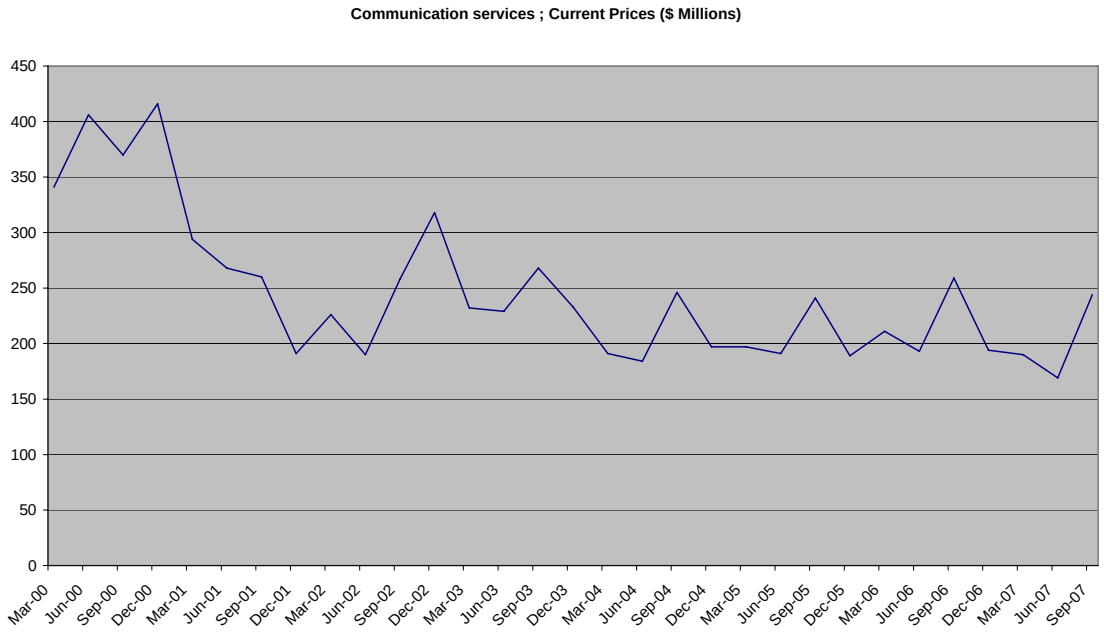
39 *Trade Profiles 2007*, WTO.

40 *World Trade Report 2007*, WTO, page 10.

41 *Underserviced: Why Australia's Services Economy Deserves More Attention*, Business Council of Australia, July 2007.

42 Ibid page 1.

Figure 9.7

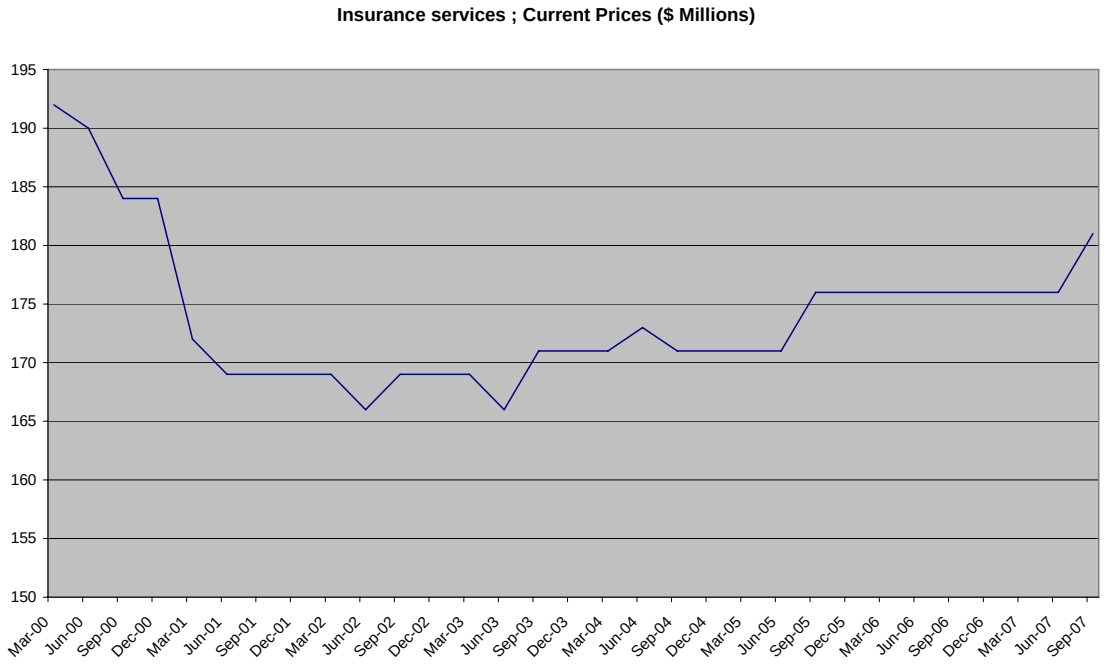


Source: **ABS 5368.0 Table 11a.**

9.3 Insurance services

Insurance services represented 4 per cent of world exports of commercial services in 2005 and grew by 14 per cent internationally between 2000 and 2005. Insurance services represented 6 per cent of exports of commercial services from Australia in 2005 and declined by 7 per cent in the period 2000 to 2005. Export of insurance services grew most strongly in the Commonwealth of Independent States (CIS) (47 per cent), Europe (18 per cent) and Asia (14 per cent) and less strongly in the US (9 per cent) and South and Central America (2 per cent). Australia ranked 10th as an exporter of insurance services but held only 1.1 per cent of the trade (USD 530 million) for the top 15 exporters compared with Europe (52.7 per cent), the US (14.8 per cent), Switzerland (9.7 per cent) and Canada (6.9 per cent). Other countries to hold a larger share than Australia included Mexico, Singapore, India, Japan and China. Australia does not rank in the top 15 importers of insurance services. Internationally, insurance services were adversely affected by payment of claims of up to $45 billion as a result of Cyclone Katrina that hit the US Gulf Coast region in August 2005.

Figure 9.8

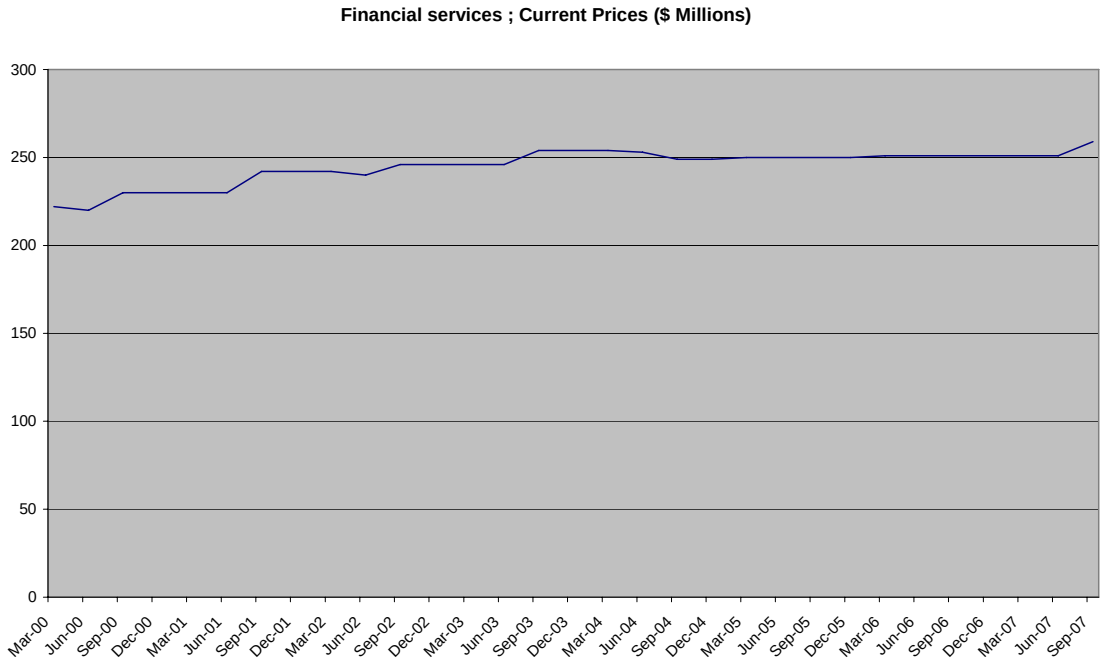


Source: **ABS 5368.0 Table 11a**

9.4 Financial services

Financial Services represented 14 per cent of world exports of commercial services and in 2005 and grew by 12 per cent in the period from 2000 to 2005. In Australia, Financial Services represented 9 per cent of commercial service exports in 2005 and grew by 11 per cent between 2000 and 2005. Over the same period, the CIS grew most strongly (26 per cent) followed by Asia (13 per cent) and Europe (13 per cent). North America was below the global growth rate (11 per cent) and South and Central America grew by 5 per cent. Australia is ranked 11th as an exporter of financial services although its share of trade (USD764) represented only 0.5 per cent of the top 15 countries well behind Europe (58 per cent), the US (21 per cent) and Switzerland (6.3 per cent). Other countries to hold a larger share than Australia include; Hong Kong, Japan, Singapore, Korea, Canada, Taipei and India. Australia is ranked 15th as an importer of financial services with imports of a smaller value (USD408) but similar proportion (0.5 per cent). Australia is the 5th largest destination for US exports of financial services (2.2 per cent) and the 9th largest European destination (0.6 per cent). The EU and the US are the largest destinations for Australian exports of financial services representing 36 per cent and 28 per cent respectively followed by Singapore (9 per cent) and Hong Kong (6 per cent).

Figure 9.9



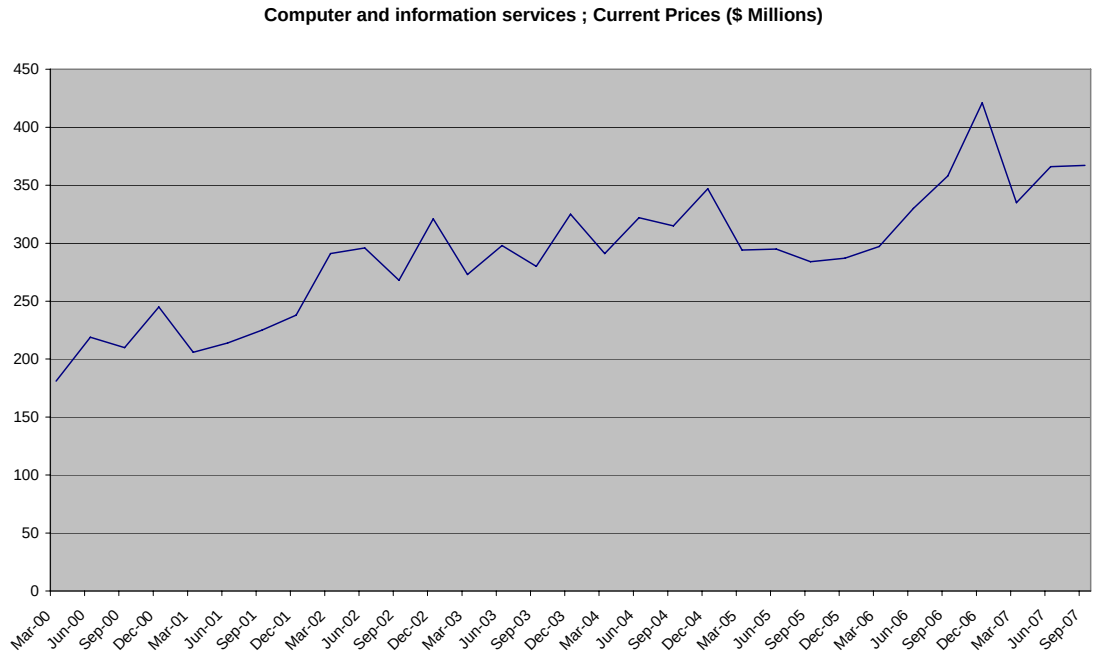
Source: **ABS 5368.0 Table 11a**

9.5 Computer and information services

Computer and Information Services represented 9 per cent of world exports of commercial services in 2005 and grew by 17 per cent between 2000 and 2005. In Australia, Computer and Information Services represented 11 per cent of commercial services exports in 2005 and grew by 36 per cent between 2000 and 2005. Over the same period, the CIS grew by 45 per cent, Europe by 19 per cent, South and Central America by 19 per cent and the North America by 5 per cent. Australia is ranked 9th as an exporter of Computer and Information Services although its share of trade (USD886) represented on 0.9 per cent of the top 15 countries in 2005 well behind the EU (60 per cent), India (16 per cent), the US (8 per cent) and Israel (5 per cent). Other countries ranked ahead of Australia include; Canada, China, Japan and Norway. The US is the major market for Australian exports (33 per cent) followed by the EU (7 per cent), New Zealand (6 per cent) and Japan (5 per cent). Australia is also ranked 9th as in importer of Computer and Information Services with a trade of USD802 representing 1.5 per cent of trade by the top 15 countries. The EU is the largest importer (58 per cent), followed by the US (16.6 per cent) and Japan (4.5 per cent). A major component of Australia's international trade in Computer and Information Services is Computer Services. In this category, Australia is both the 7th largest importer and exporter of computer services. The WTO estimates that Australia's share of the top 15 exporters is 1.0 per cent and of the top 15 importers 1.8 per cent. India is seen as a leading country for Information Technology outsourcing recording computer services exports of $15.8 billion in 2005 and accounting for around 70 per cent of Asia's exports of Computer and Information Services. Other economies in the region are also emerging. China was expected to have 1200 software development companies employing nearly one million people by the end of 2005. The Chinese Government has launched a program aimed at doubling that country's computer services exports by 2010. Other Asian countries such as Malaysia and Singapore as well as

the Russian Federation and South and Central America are developing computer services outsourcing businesses.

Figure 9.10



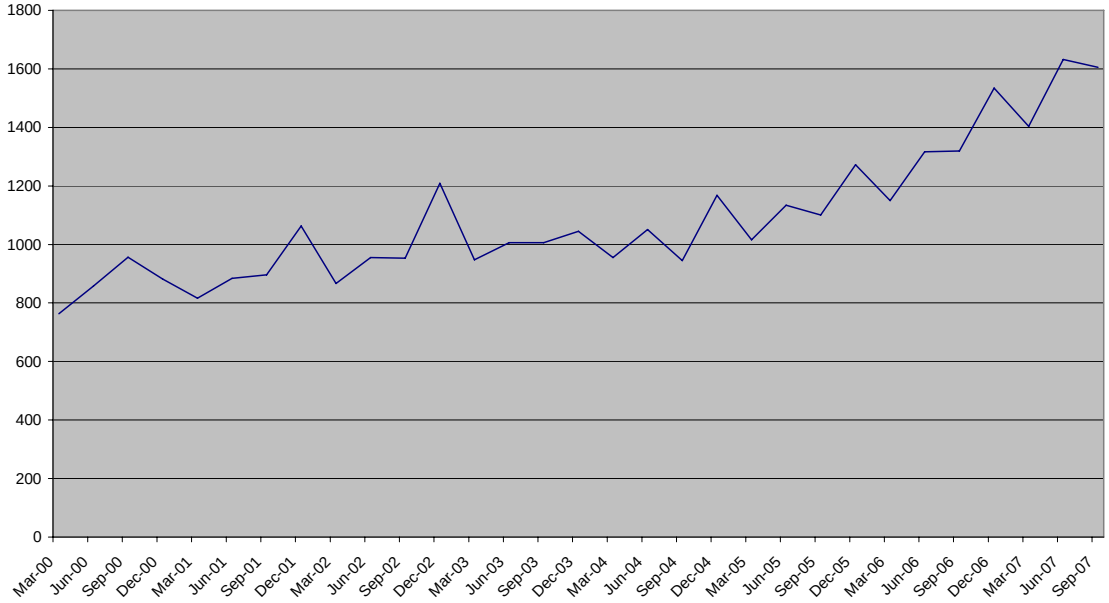
Source: **ABS 5368.0 Table 11a.**

9.6 Other business services

Other Business Services is a diverse but dynamic area of world services trade representing 50 per cent of global commercial services trade in 2005 and growing by 13 per cent between 2000 and 2005. In Australia, Other Business Services represented 41 per cent of commercial services exports in 2005 and grew by 31 per cent between 2000 and 2005. This group of services grew strongly in the CIS between 2000 and 2005 (22 per cent), Europe (14 per cent) and lagged the global rate in the US (8 per cent) and South and Central America (10 per cent). Australia's share of trade in these services is tiny and is not ranked in the top 15 either as an exporter or importer. The top 15 exporters is dominated by the EU (55 per cent), the US (11.2 per cent), Japan (4.9 per cent), Hong Kong (4.4 per cent), China (4.2 per cent), India (3.7 per cent) and Singapore (3.7 per cent). Major importers are; the EU (61 per cent), US (8 per cent), Japan (6 per cent), China (3.4 per cent) and India (3.4 per cent).

Figure 9.11

Other business services ; Current Prices ($ Millions)

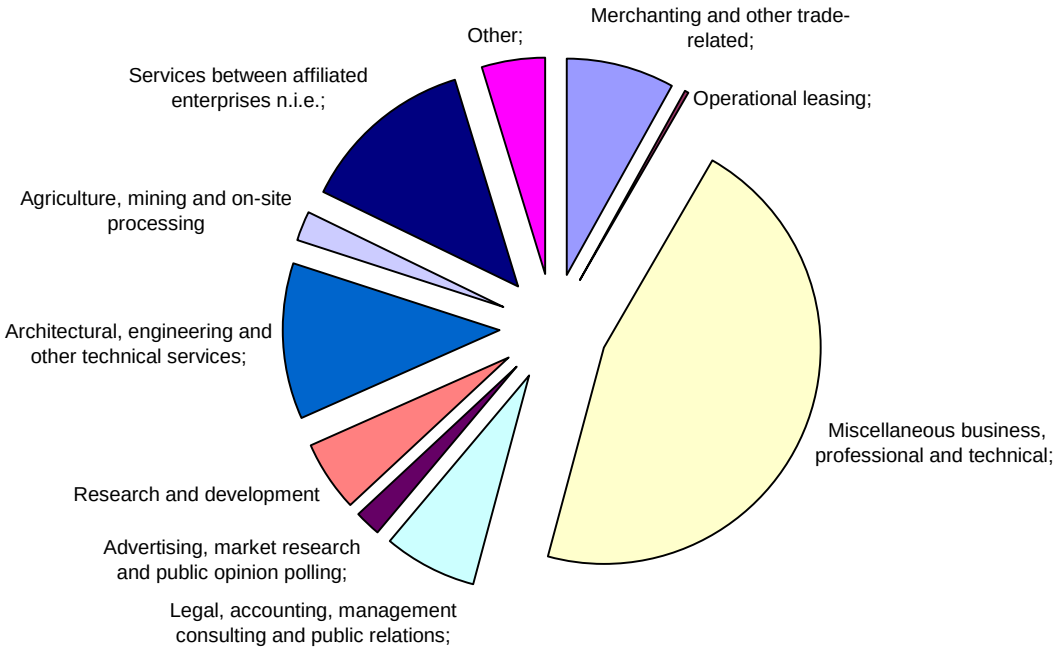


Source: **ABS 5368.0 Table 11a.**

The nature of service traded under ‘other business services’ varies from country to country. In Australia, the category is dominated by ‘miscellaneous business, professional and technical services’ with ‘architectural, engineering and technical services’, ‘services between enterprises’ and ‘merchanting and other trade related services’ the next largest categories.

Figure 9.12

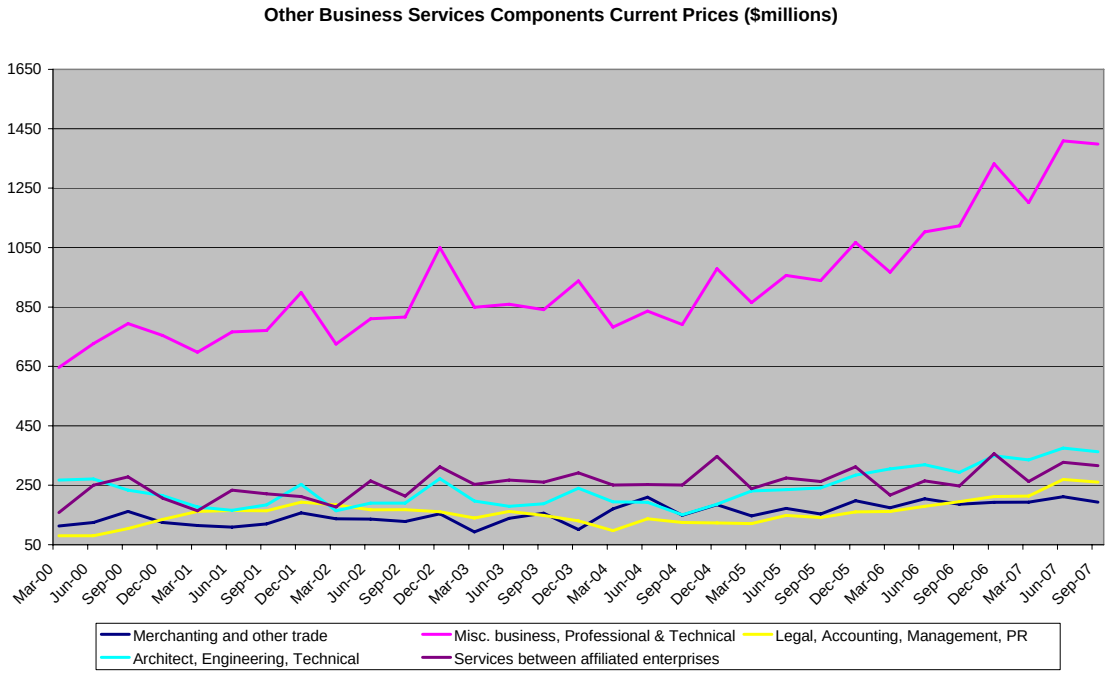
Other business services components 2005



Source: **ABS 5368.0 Table 11a.**

All of the major categories have shown good growth over the period 2000 to 2005 with legal, accounting and management showing the strongest growth (42 per cent), followed by Miscellaneous business services (31 per cent). Only Architectural services showed limited growth over the period (0.5 per cent) although it has grown more strongly in recent years.

Figure 9.13



Source: **5368.0 Table 11a.**

The overall conclusion is that given the poor performance of the Australian services sector in generating exports, there must be a fusion of Off-shoring issues with policy assessments for improving Australian services sector exports.

10. The total impact of outsourcing and strategies for amelioration

In the OECD's 2007 report, in addition to the productivity/cost reduction impacts analysed above, the OECD notes the possible beneficial flow-on impacts of Off-shoring:

- export growth;
- control of inflation; and
- better returns on capital.

The negative impacts include:

- fall in real wages of certain workers;
- deterioration in the terms of trade;
- decline in capacity for innovation;
- loss of tax revenue; and
- differential regional impacts.

These issues will be examined in turn. This chapter concludes with an assessment of what is likely to be the preferred strategy for Off-shoring.

10.1 Export growth

If the Off-shoring leads to the establishment of a presence in another country, then this may lead to exports from the Off-shoring country. However, in the main this would only be relevant to where the Off-shoring created employment in the same or affiliated enterprise in the foreign jurisdiction.

Given the poor Australian export performance this is unlikely to be relevant in the majority of cases. In any case, this type of Off-shoring can be more readily identified and given a different status.

10.2 Control of inflation

This case relates to the present case in Australia, where there is excess demand for skilled labour and, therefore, inflationary pressures would be eased by outsourcing leading to lower interest rates and improved macroeconomic balance.

However, as noted in Chapter 1, the economic cycle will always be ubiquitous. To permanently trade off employment losses for relatively temporary short-run gains is not responsible. Far better to generate temporary employment loss by postponing government expenditure initiatives and postponing tax cuts, or temporarily increasing tax rates.

10.3 Increased returns on capital

This is the case where there is not purely price reductions, as assumed above prices are maintained or not reduced as far as could be done. This means that there is an increase in profitability, cash flow, return on capital and, therefore, investment.

An alternative view is that this situation could also simply lead to increased incomes for highly skilled employees and service managers, along with some increase in dividends. All that would happen in this case is that there would be little offsets to the negative flow-on impacts of Off-shoring and there would be a significant decline in the equity of the distribution of income as noted above.

10.4 Fall in real wages for skilled and unskilled workers

There is now a consensus that the Off-shoring of manufacturing employment over the 1980s and 1990s in developed economies by increasing the supply of unskilled and semi skilled labour relative to demand contributed to the fall in real wages for these types of workers, relative to intermediate and high skilled labour.

As the OECD points out, Off-shoring of service sector occupations is now allowing the transferring of intermediate and high skilled occupations, which over the next two decades will lead to downward pressure on the real incomes for those occupations at risk.

10.5 Deterioration in the terms of trade

The OECD report notes that there is a possibility that Off-shoring can lead to deterioration of a country's terms of trade. However, there is a significantly larger probability that there will be deterioration in the current account balance. In Australia's case this will be deterioration in the current account deficit.

For Australia, with a high current account deficit and high international debt as a per cent of GDP, this outcome is unlikely to be non-trivial.

10.6 Possible decline in capacity for innovation

This applies in particular to the Off-shoring of research positions.

10.7 Loss of tax revenue

This has already been noted above. This will be an additional negative impact on top of the consumption demand, especially if a public sector borrowing constraint is in operation.

10.8 Regional effects

The key drivers of growth in a national economy are generally located in a small number of regions. The Off-shoring starts to break up the networks and undermines the ability of the region to retain tacit knowledge, then the consequences for growth potential of both the regional and national economy could be significantly undermined.

10.9 When Off-shoring does not matter

There is one unambiguous case when Off-shoring does not matter. This is when:

(i) household savings ratios are high and household debt to income is low;

(ii) the current account surplus is high and international debt to GDP is low; and

(iii) the public sector surplus is high and public sector debt to GDP is low,

and this is likely to remain the case for the foreseeable future.

In this case the labour released from Off-shoring can be easily reabsorbed by:

(i) interest rate reductions encouraging households to undertake debt financed consumption; and

(ii) expansionary fiscal policies plus tax reductions and expenditure increases.

The only criteria that Australia satisfies currently is (iii). Australia is probably near debt saturation on the household side and may reach international debt saturation at some point in the near future.

10.10 The best specific intervention: increase the service sector export capacity

In a long-run historical context, Off-shoring is simply the continuation of the forces of globalisation that have been steadily increasing in intensity since time immemorial. By this is meant the long-run tendency for the share of trade (exports plus imports) to increase in gross domestic product (GDP).

For most of this historical period the increase in exports and imports as a share of GDP was driven by merchandise trade. That is, trade in agricultural, mining and manufactured product. The countries which responded best to the growth in merchandise trade responded to the growth in imports by developing export industries so that the negative impact of the growth in import penetration was, at worst, neutralised and, at best, significantly offset by the growth in exports.

Those countries which most successfully responded to tradeable goods Off-shoring were countries which successfully grew their tradeable goods export industries to counter the threat of import growth and developed sophisticated industry intervention policies to encourage export growth. Perhaps the best documentation of how this was done in the 20th century across a range of countries is Carlos Sabildon's "*Manufacturing Technology, and Economic Growth*", M.E. Sharpe New York, 2000. A longer-term look, that is going back to Henry VIII, of how it was done is to be found in H.A.-Joon Chang's "*Bad Samaritans, The Myth of Free Trade and the Secret History of Capitalism*", Bloomsbury Press, New York, 2008.

The response to service sector Off-shoring should be the same as tradeable goods Off-shoring. That is, the core response should be to grow service sector exports with the quantitative target being to at least neutralise the employment losses from Off-shoring. Off-shoring should, as far as practical, be matched by the growth in employment created by the growth in service exports.

The poor performance of Australian service sector exports over the past decade has resulted in a poor performance for the contribution of service sector exports to total employment growth. In 1996 service sector exports directly generated 250,000 employment positions in Australia, or 3.9 per cent of total tertiary sector employment. By 2006 this had grown to 318,000, or a fall to 3.7 per cent of total tertiary sector employment. It should be noted that in the Olympic year (2000-01), services exports contributed 348,000 to total tertiary sector employment.

Under the base case, to neutralise the impact of the Off-shoring employment loss, at the very least, that is abstracting from the growth in the labour force, the tertiary sector needs to generate 850,000 employment positions. That is, take the total tertiary sector employment directly due to exports to over one million. To do this total tertiary exports would have to grow from $42 billion in 2007, in 1999 prices, to $194 billion, or a growth rate of 8.1 per cent per annum over the forecast period.

In the context of the growth of Asia-Pacific trade over the period a 6 to 8 per cent per annum growth in exports would be the expectation, not the target as the outcome would simply maintain a degree of stability in Australia's share of the Asia-Pacific services trade.

However, in the context of the recent historical outcomes of large falls in the Australian share of Asia-Pacific services trade, to achieve the target will be difficult and would require sustained policy intervention.

The base design of this intervention lies outside the scope of this study. However, Table 10.1 gives an indicative guide of the industry structure of tertiary services exports circa 2025, while Table 10.2 profiles the corresponding direct employment created from exports. The direct employment generated from exports for tourism (accommodation/retail trade), transport, financial services, and business services will have to increase significantly.

Table 10.1 Tertiary sector share of exports by broad industry – indicative targets 2025 (per cent)		
	2006	**2025**
Utilities	0.1	0.1
Construction	0.7	0.4
Wholesale trade	18.0	11.9
Retail trade	6.2	4.8
Accommodation	7.6	7.2
Transport	37.3	35.7
Communication	1.7	1.7
Finance	3.2	9.9
Ownership of dwellings	0.8	0.2
Business services	13.1	18.0
Government	0.5	0.2
Education	8.6	8.1
Health	0.7	0.7
Recreation	1.2	0.9
Personnel services	0.3	0.2
	100.0	**100.0**

Table 10.2 Tertiary sector direct employment from exports – indicative targets 2025 (thousands)		
	2006	**2025**
Electricity, gas and water	0.1	0.4
Construction	2.4	5.6
Wholesale trade	46.5	86.0
Retail trade	35.0	95.7
Accommodation	33.2	116.2
Transport	71.5	207.9
Communication	2.9	8.3
Finance	6.8	69.9
Ownership of dwellings	0.0	0.0
Business services	36.3	226.8
Government	1.5	3.7
Education	70.0	322.3
Health	5.1	22.0
Recreation	4.8	15.3
Personnel services	1.7	5.2
Total	**317.9**	**1185.3**

11. Strengthening Australia's services sector: Policy recommendations for a way forward

This report has made it clear that Australia is losing ground in the international trade in services. In that regard it is consistent with other reports on Australia's services industry such as a recent survey undertaken by the Business Council of Australia[43]. The risks of this situation are that; (a) jobs are being lost to off-shore (both directly and indirectly); (b) Australia is losing key competencies that will undermine our long-term competitiveness, and; (c) a vicious cycle is emerging where the loss of competencies causes loss of competitiveness which sets up further loss of jobs and competencies. While off-shoring is generally seen as a cost (labour) driven exercise, it is worth noting that the major services trading nations are not low wage countries. Countries do have a strong services sector without a low wage economy. Even in less developed countries such as India (a services trade leader) rates of pay are rapidly accelerating toward global parity. Over the medium to longer term, the mobile nature of services will create a steady pressure toward global labour cost parity. What will differentiate countries engaged in services trade will be the competencies they have to offer; their knowledge leadership in terms of technical evolution and innovation; brand and market leadership, and; possessing a critical mass of competitive accessible skills. Current policy settings in Australia are not addressing the need to build critical competencies. Fault for this rests with a failure of the previous government to acknowledge the crucial role services need to play in ensuring Australia's future beyond a resource quarry and lack of leadership in key service industries. Australia cannot allow the services sector to follow the same path as manufacturing where competencies (skills and knowledge combined with invested capital) are transferred overseas effectively removing the sector's foundations.

Developing a policy response to the situation facing the Australian services sector will require more than simply moving a few existing policy levers up or down. A compete root and branch overhaul of the role the Australian government can play, in cooperation with state governments, will be required for any new initiative to be effective. The new policy framework must be appropriate to the global economy of the 21st century and not derived from the ideologically driven policy responses of the late 20th century. Policies to develop a strong services economy in Australia should not rest solely on the conviction that the invisible hand of a free market will automatically deliver an optimal outcome for Australians – nor does this paper advocate that it should be driven solely by the contrary position. It is premised on recognition that government plays a central role in how public sector resources are allocated, in building knowledge, in facilitating market intelligence, in creating networks and clusters of industry and, in branding and marketing Australia's core service sector competencies. The 21st century is and will continue to be characterised by an increasingly integrated global economy. In this context, Australia will need to make judgements on which parts of the services industry have the capacity to compete and therefore which areas of competence should be fostered through a range of government policies.

The key proposal in this paper is unashamedly corporatist in that it derives from a standard corporate planning process that would be adopted by an international business deciding how resources should be allocated to compete in global markets. Australia cannot be 'all things to all people'. At the moment it is heading down the path of being nothing to no-one. It must reverse this by deciding where it has the best prospects for competing in the international market place and ensuring businesses operating in these areas are given every chance to succeed.

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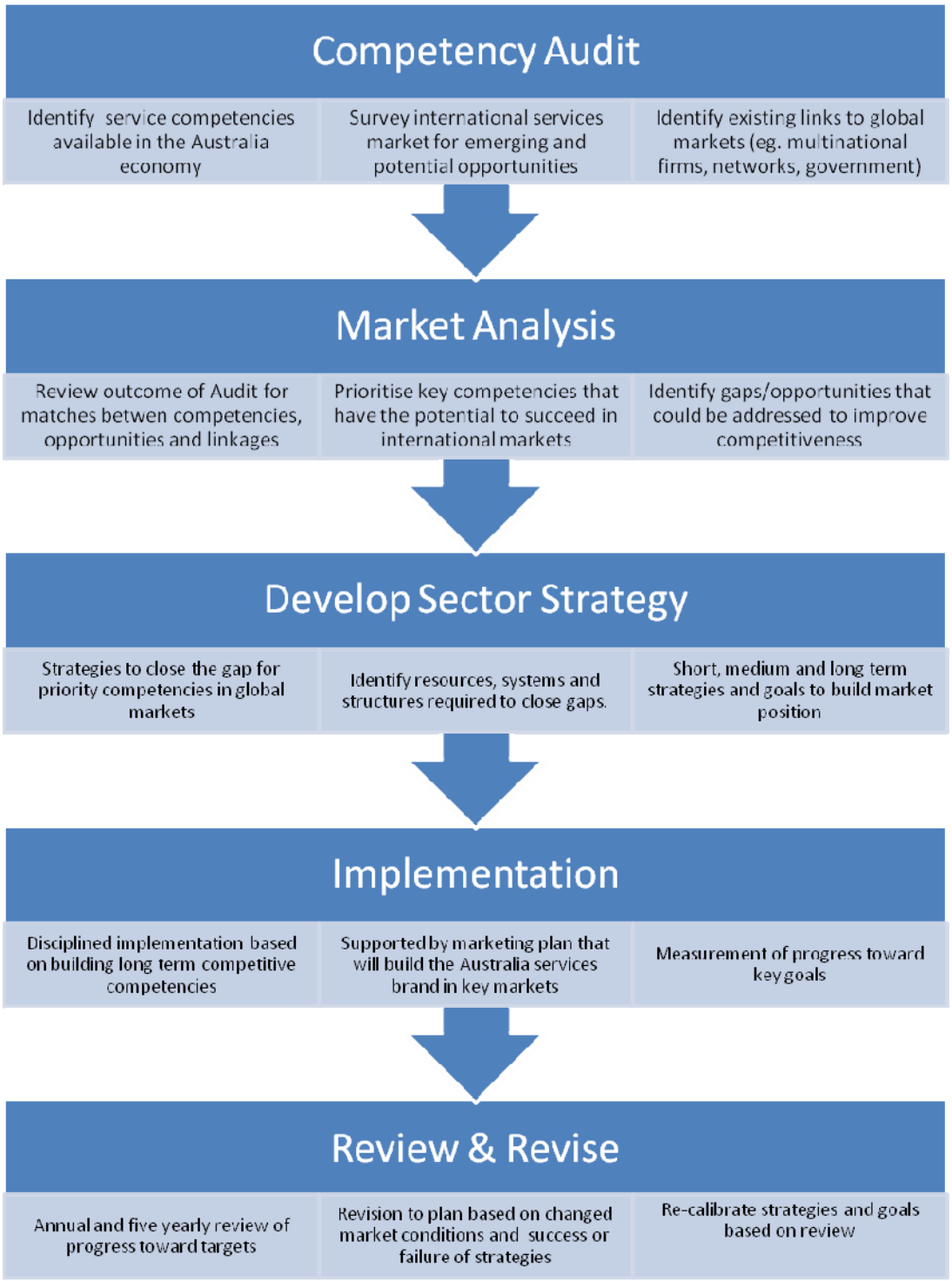
[43] *Unserviced: Why Australia's Services Economy Deserves More Attention*, Business Council of Australia, Discussion Paper July 2007

The strategy envisages a series of stages.



Implementation of the plan would involve two key structural initiatives within government:

1. Establishment of a **Service Sector Task Force** to manage the processes described above and provide succinct policy advice to a Service Sector Cabinet Sub-Committee (see below). The Task Force may become part of an overarching trade, investment and industry policy and implementation entity. This entity would look holistically at a

range of policy initiatives to drive the competitiveness of the Australian economy and deliver dividends to Australians in the form of better, long terms skilled jobs that can compete in the international marketplace.

2. Establishment of a **Service Sector Cabinet Sub-Committee** to receive and review the strategic plan developed by the Service Sector Task Force and coordinate all relevant parts of government policy to support this strategy. This would include for instance, knowledge development policies of different agencies, education and skills development as well as internationally competitive physical and communication infrastructure. The ability of Cabinet to coordinate the implementation of a strategy will be a key determinate of the plan's success.

In developing the service sector plan, the Task Force should give consideration to:

- **Knowledge linkages**: Bringing together different arms of Australia's knowledge development infrastructure from learning institutions, research organisations, industry and government creating new knowledge interfaces and providing direction to learning programs.
- **Market linkages**. Not traditional point to point export assistance but by developing links with decision makers in global service delivery entities (who may not be based in actual markets). Gaining access to new and emerging markets where this may be limited by existing regulations.
- **Leadership development**. Parts of Australian industry are leaderless when it comes to dealing with international markets. Government can play an important role in fostering and recognising industry leaders capable of building both market and knowledge linkages.
- **Investment attraction**. Attracting key global investments that capitalise on, develop and integrate Australia's core competencies into the global economy.
- **Scaling up** by bringing together firms through networks and clusters in order to respond to the demands of global supply chains. For instance, in many parts of Australia's services sector firms may be small but clustering may create potential to access international markets.
- **Physical infrastructure** to support market access; both physical and communication infrastructure necessary for services businesses to operate in the global economy (highly competitive low cost broadband linkages).
- **Cost reduction**. Through both the tax system and infrastructure government can influence the cost base for business operating in Australia and therefore its competitiveness in the global market. This includes the cost of research and development.
- **Marketing and branding**. Australia needs to be positioned in the international market in a way that highlights its core competencies and preparedness to support further development in those areas. It will be important to develop a strong branding effort to underpin the strategy.

The longer-term solution proposed in this report is that service sector exports need to grow. Currently, the direct contribution service sector exports makes to employment creation is low, being of the order of 320,000 to 350,000. Over the last half a decade the service sector's exports growth performance has been poor. In order to neutralise the likely loss in employment from off-shoring over the next two decades, service sector exports would have to grow by 8 per cent per annum, with that growth led by business services exports and finance services exports. This is not a big ask in the context of services sector export growth

in Asia-Pacific. It is a big ask in the context of Australia's recent performance. Short term policy intervention will be needed. Measures should include:

1 Tax system

In the short term, Australia will need to look at the use of incentives and disincentives to turn the tide on the vicious cycle of off-shoring and its impact on Australian jobs and competencies. Many businesses in the services sector are driven by short-term considerations rather than long term. For some financial institutions, off-shoring is often used as a short term investor relations exercise to distract from poor profit results or lack of strategic direction. Sending a few thousand jobs off-shore may appeal to the short-term horizon of investment analysts who are rewarded on three month or annual performance but it may also handicap the business and the country in the long term. US Presidential aspirants Hilary Rodham Clinton and Barack Obama have both identified the US tax system as an issue in off-shoring claiming that it provides an incentive for companies to move jobs off-shore. They say that in its rush to embrace off-shoring, the US overlooked the costs of job losses and have vowed to remove incentives for moving jobs to other countries. The Australian tax system needs to be similarly reviewed so that it removes any encouragement for off-shoring. In order to reverse the vicious cycle, incentives should be introduced to retain jobs in Australia as these jobs will contribute to the ongoing development of Australian competencies and competitive advantage. By creating a more favourable tax treatment for income earned in Australia compared to income earned from off-shoring work that could be undertaken in Australia, Government will be able to create a break in the cycle.

2 Free Trade Agreements

Free trade Agreements will also need to be re-examined. Australia has derived very little economic benefit from existing free trade agreements. Many of these agreements are political treaties that achieve diplomatic purposes but do not advance Australia's trade position. The agreements normally prescribe more favourable terms for other countries or overlook restrictive trade practices in those countries simply for the purpose of securing an agreement. Australia can no longer afford such political statements and where bi-lateral agreements are proposed Government must ensure that they create a genuine level playing field (when all things are considered). Agreements signed by the previous government should be reviewed and where the terms are not equal they should be renegotiated. Future agreements must be negotiated on the basis of real benefit to Australia generally and specifically for those parts of the economy regarded as Australia's core competencies.

3 Right to know

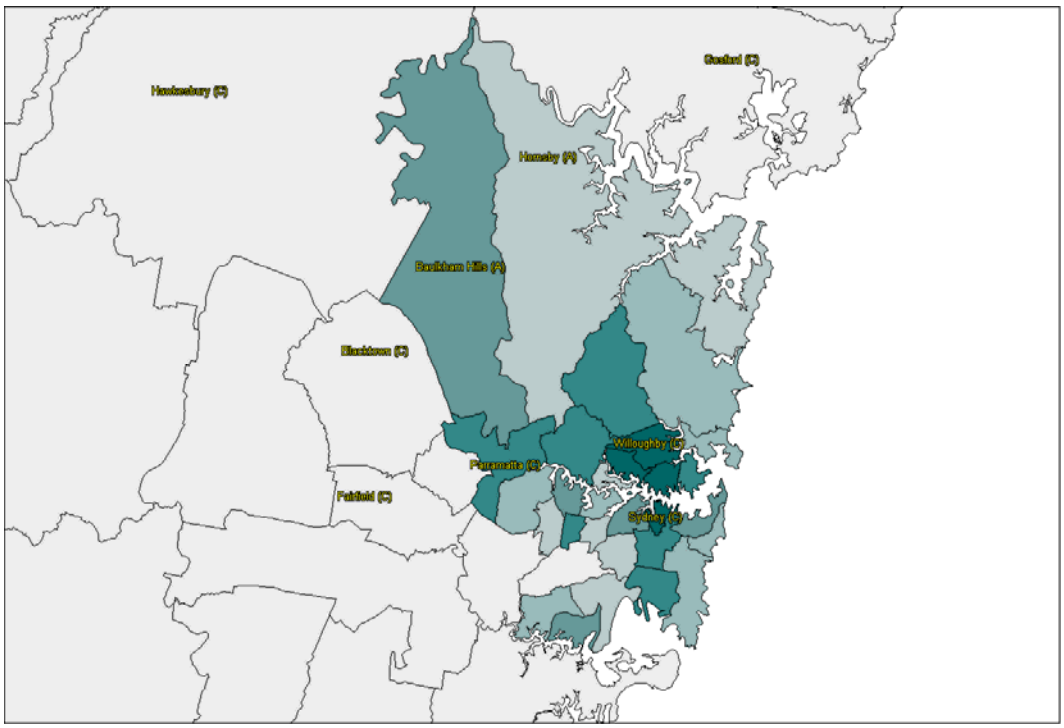
Given that services often involve the passing of information and data on individuals, Australia should introduce 'country of origin' legislation for services to match similar requirements for manufactured goods. Such a requirement would allow consumers to make decisions about which providers they choose to support based on where they would like their services to be delivered from, who is handling their data and where it may be stored.

A final word

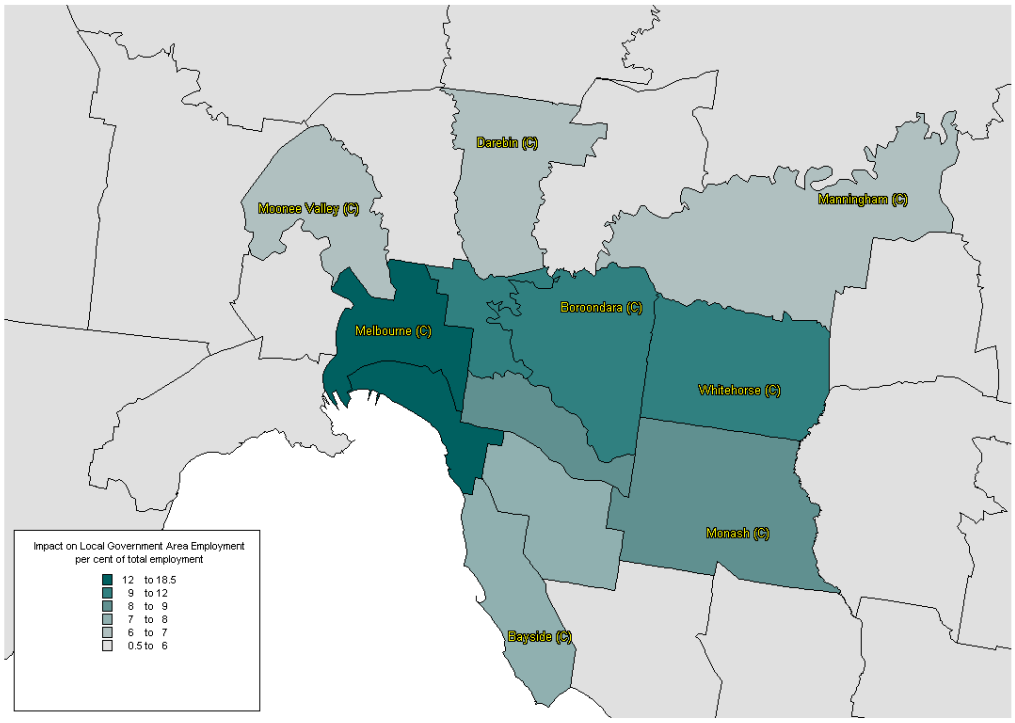
If the key message of this report is that Australia has much to lose by not addressing the international competitiveness of its services sector, these policy recommendations offer an avenue to start to address this threat in a constructive long-term manner. This report is just the start of turning around a ship that has been heading in the wrong direction (or perhaps more appropriately directionless) for more than 10 years. More work will be needed. A great deal of commitment will be required. Importantly different attitudes will be required from both government and the leaders in our services industries. If the situation is not addressed, Australia and Australians will lose not just jobs (even though the number of jobs at stake is very serious) but a place in the global services economy.

A1 Geographic spread of jobs at risk

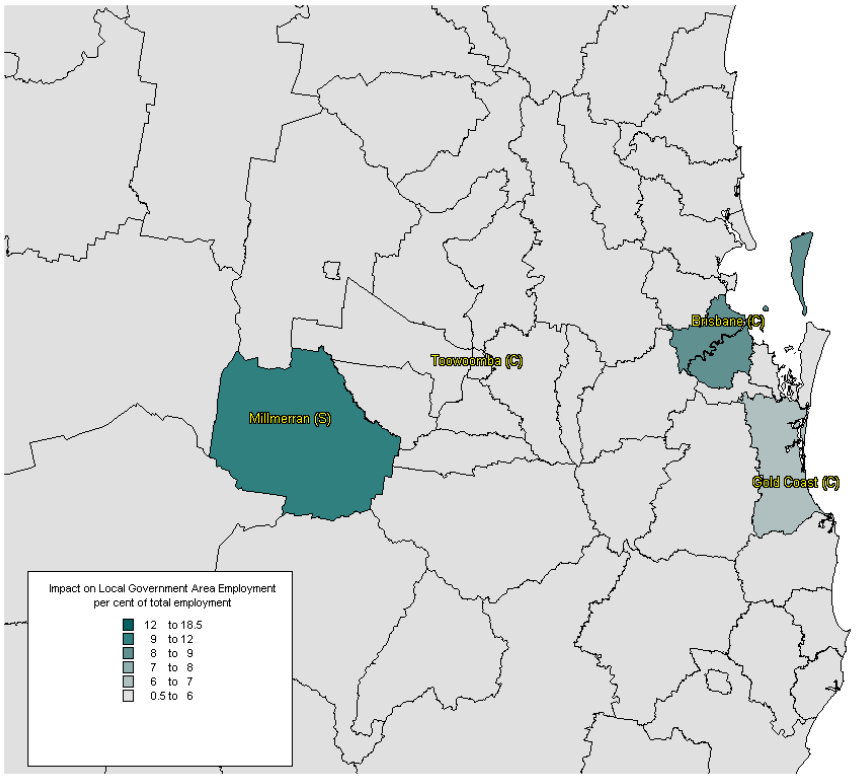
Sydney area



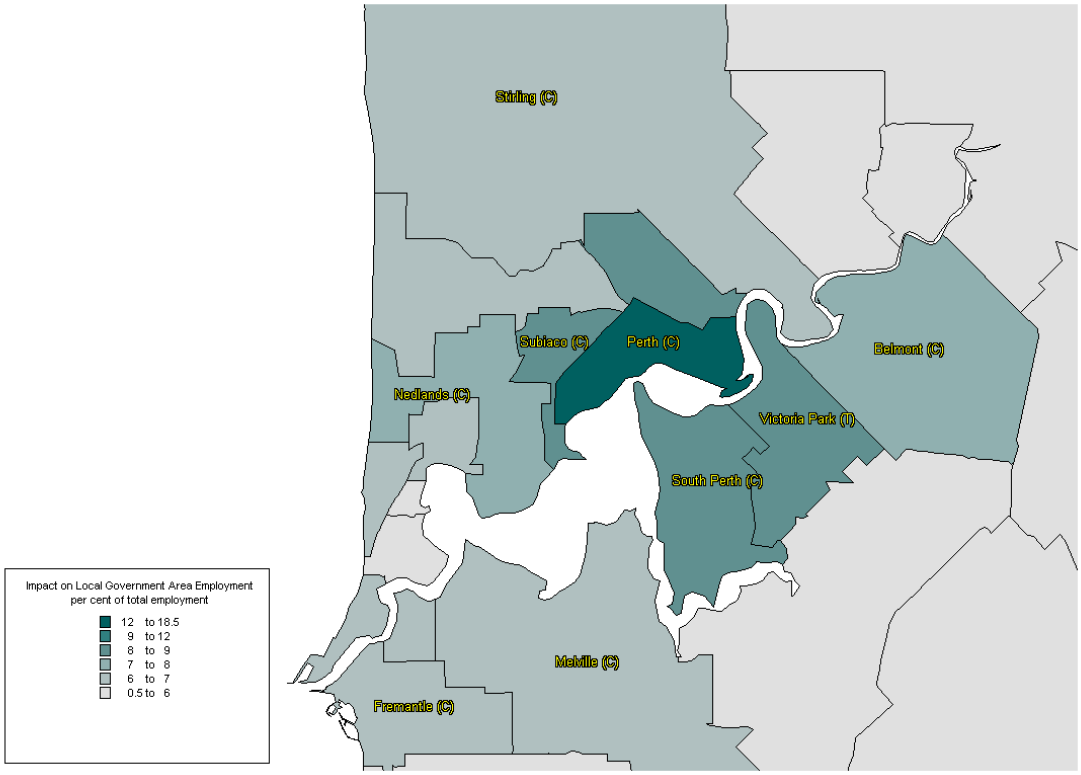
Melbourne area



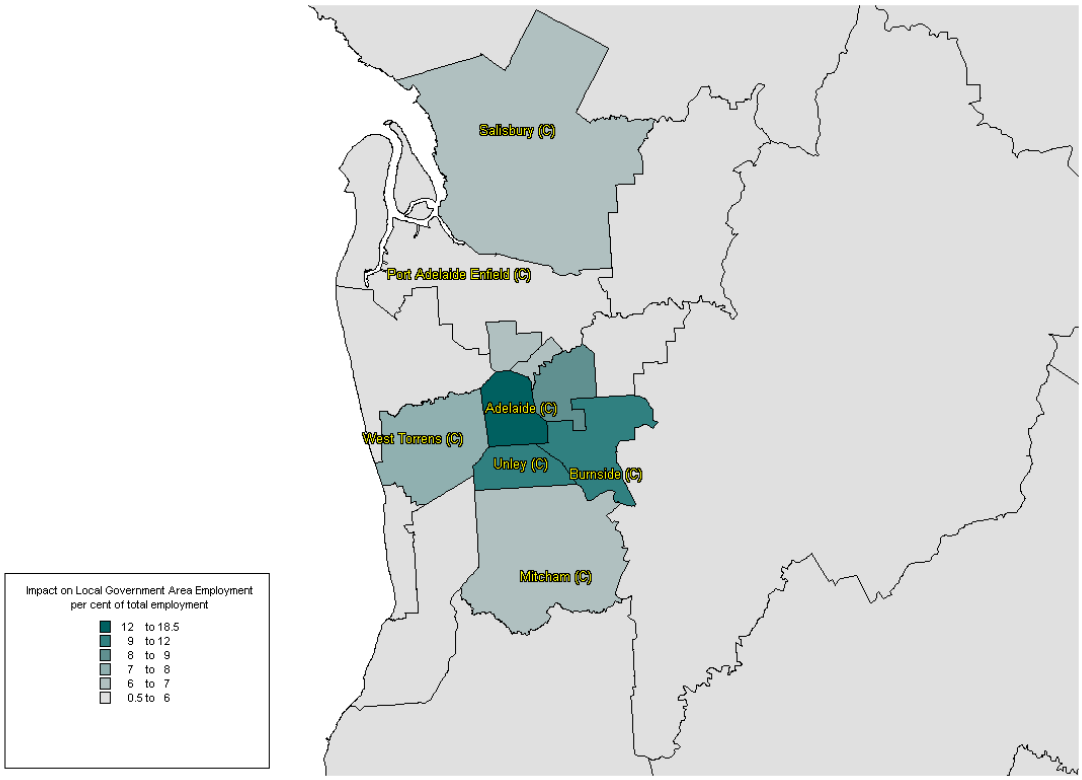
South East Queensland



Perth area



Adelaide area



Tasmania