Large scale export of East Coast Australia natural gas: Unintended consequences

A study of the national interest effects of the structure of the Australian gas industry.

A report to
The Australian Industry Group and the Plastics and Chemicals Industries Association

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Executive summary

"*One molecule of natural gas is chemically the same as another, but where it is found has enormous implications for global politics.*

The price of gas in the US following the shale drilling boom is now a third of that in western Europe and a fifth of that in Asia."

Financial Times, 17 July 2012

"Gas prices on the eastern seaboard will follow the big rises already hitting downstream industrial users in Western Australia, says Santos chief executive David Knox.

At a Sydney forum on the future of gas, Mr Knox stated that prices in the east of between $3 and $4 a gigajoule would rise to between $6 and $9 for new domestic customers as increasing volumes were exported.

That is the range we are talking about for anyone coming to us now," he said. "We are actively negotiating with a number of buyers … and you are going to see an increase in prices."

Australian Financial Review, 23 August 2012

Natural gas is a fundamental source of energy for power generation, industry, consumers, hospitals and institutions generally. In today's world of transition to greater use of renewable energy it plays an important role in facilitating cost effective peaking power to fill the gaps when renewable supply is not available. It is both an efficient relatively clean fuel source and a critical feedstock for conversion by industry into value-added consumer products. Its value to the domestic economy is very significant as the alternatives are less efficient and, in the case of coal and oil, have significantly higher greenhouse gas emissions.

Many major projects to export Liquefied Natural Gas from Eastern Australia have been approved and will start to operate over the next several years. This will significantly impact the domestic supply of natural gas. In this report we do not argue against the export of LNG but emphasise that the benefits from exporting LNG should be weighed against the benefits of ensuring competitive supply to the domestic gas-dependent manufacturing sector. In a market where there are sufficient reserves of the resource, as appears to be the case in Australia, the typical response would be for additional supply to be made available to meet domestic demand. However, due to the nature of the gas resources, their location, limitations in infrastructure and the way in which we manage these resources, there is a serious risk that this will not be the case. Even a temporary period without secure access to domestic gas would have significant unintended consequences, as would a shift to LNG-linked gas pricing. As such, it is prudent to look at the implications of these developments for consumers and industry.

The National Institute of Economic and Industry Research (NIEIR) has made such an assessment, reviewing the literature and conducting its own assessment of the sectoral and macroeconomic implications of these developments. The findings are concerning.

NIEIR has found that:

- if existing plans proceed, gas exports from eastern Australia will rise from 2 million tonnes in 2015 to 20 million tonnes in 2018, and possibly 24 million tonnes in 2023;

- the current policy framework and market settings for the Australian gas industry favour export of LNG without a subsequent assurance of reliable, competitively priced supplies of gas for domestic industry. Such supplies have historically been a competitive advantage for Australian industry, and gas export revenue is insufficient to compensate Australia for the loss of this advantage;

- natural gas is essential to a range of industries, particularly non-ferrous metals and basic chemicals, but also plastics, pharmaceuticals, paints and cosmetics. Secure local supply at competitive prices is a fundamental requirement for the continuation of a significant part of production and the development of new investment in these industries;

- contracts for the long term supply of gas to domestic industry have 'evaporated' as a consequence of export commitments;

- Australia has only a few years before significant economic loss is likely to be felt from the failure to secure an affordable supply of natural gas to domestic users;

- domestic gas users are increasingly being offered "surplus" gas volumes and prices that do not reflect domestic supply, demand or extraction costs, but are instead linked to East Asia's LNG market – the highest-priced gas in the world. This is a radical reshaping of the domestic gas market, constraining supply (in the near term at least) and driving prices to high (and for many industries uneconomic) levels;

- current gas production and proven reserves will need to expand dramatically in order to support the LNG expansion without significant large scale suppression of gas use on the domestic economy. While the total gas resource is thought to be very large, proving up additional resources and developing them will take time and faces community opposition and other barriers. To ensure gas availability for domestic users, the management of reserves and their supply to market needs attention if domestic needs are not to be overlooked in the rush to export this valuable resource;

- there are important opportunities to expand use of gas in industrial production and electricity generation, but even so domestic consumers cannot make use of the whole gas resource. There are worthwhile benefits to pursue from exporting gas production beyond these needs. But each petajoule of natural gas that is shifted **away** from industrial use **towards** export, whether because of tight supply or uneconomic pricing, means giving up $255 million in lost industrial output for a $12 million gain in export output. That is, for every dollar gained $21 is lost. This increases to $24 when economy-wide impacts are taken into account;

- the dramatic shift in the domestic gas market will have wider impacts well beyond the gas intensive industries:

    - increased operating costs for gas-fired electricity generators due to high gas prices. Such generators would see cost increases three times greater than those currently resulting from the carbon tax. Wholesale electricity prices would thus rise, and the viability of new gas-fired generation would suffer. These plants already play an important role in the electricity market for both peak power and

base load. That role is expected to grow to meet emissions reduction targets and provide backup for expanding renewable generation;

- some substitution away from gas towards electricity by business and households, to reduce their exposure to rising gas prices. This would still leave their costs higher than at present, and would raise greenhouse emissions;

- a slow-down of general economic activity resulting from impacts of the tighter gas supply and higher costs for gas and electricity;

- the expected economic response to the East Coast LNG expansion will involve a combination of the adjustments above. As a result, modelling indicates that, by 2040 the gross production benefit for East Coast LNG expansion will be $15 billion annually, in 2009 prices. However, taking into account the negative effects of adjustment on other sectors, annual GDP will be $22 billion lower than it would be with secure and affordable gas. An alternative 'benefit indicator' used for this study, which combines private consumption, tax receipts and net national product, will be reduced by $46 billion;

- under current policy settings and market structures, the unwanted consequences of the significant boom in LNG exports will persist even if, as is likely, adequate natural gas reserves exist and are brought to market; and

- there are substantial further risks that would lead to even greater costs if realised. These risks include:

  (i) LNG prices may be lower than currently expected. While this would reduce the extent of domestic price rises, it would also reduce gross export benefits while leaving domestic supply constrained in the short-to-medium term by contracted export commitments; and

  (ii) industry will likely be unable to grow without secure affordable gas supplies, leading to additional damage.

The rules of thumb developed in this study for these additional effects are:

- for every 1 per cent reduction in the LNG price the economy-wide benefits from LNG exports will be reduced by approximately 2 percentage points. This stems mainly from the fact that tax receipts and domestic profits will be disproportionately impacted. Foreign interest payments and repayment of debt will still have to be paid; and

- for every $1m of existing chemical industry output that is saved by increased natural gas supply there is another $1m of output that can be obtained by using the competitive advantages for domestic natural gas availability in general, and natural gas liquids in particular.

The likely consequences of the current policy and industry settings on natural gas export are serious for both industry and households. There is an urgent need for more recognition of these impacts, and for a debate on how they can be prevented, alleviated or adapted to. LNG export is a positive for Australia as long as it proceeds without significant harm to the domestic sector and with confident assurance of domestic supply.

1. Background and study objective

1.1 Background

Natural gas is an essential input to value creation and productivity in many of Australia's key industries. If the supply of natural gas is threatened or, short of this, confidence in its ready availability at competitive prices is weakened, so too are the industries that use the gas as a raw material or fuel. Current developments in Queensland, focusing on LNG exports, are threatening Eastern Australia's gas-dependent industries by weakening confidence that gas will be available at competitive cost.

In this report we do not argue against the export of LNG but emphasise that the benefits from exporting LNG should be weighed against the benefits of ensuring competitive supply to the domestic gas-dependent manufacturing sector. Our work indicates that the national benefit from the supply of gas to the many industries that are involved is many times the gain due to export of the same quantity of gas.

Taking these benefits into account, from the beginning the Western Australian Government was active in ensuring that domestic use of the offshore North West Shelf gas resource was to be protected. The Government explicitly committed to actively ensuring that this would be the case. The provisions of the original LNG Act drafted in the 1970s to pave the way for Australia's first LNG export project are specific in the way the reserves are to be used for both export and domestic users. Two sections of the Act indicate this.

> *"**Notification of additional reserves of natural gas***
>
> *20. If the Joint Venturers discover reserves of natural gas additional to those required for their commitments contemplated in recitals (c) and (d) of this Agreement during their exploration programme in the offshore Dampier region (carried out under the provision of the Petroleum (Submerged Lands) Acts), which in the opinion of the Joint Venturers are capable of commercial development the Joint Venturers shall –*
>
> *(a) notify the Minister of the extent and nature of such additional reserves;*
>
> *(b) having regard to the State's desire for the petrochemical industry to be established in Western Australia, investigate the processing of all or part of such natural gas for use as petrochemical feedstock; and*
>
> *(c) enter into discussions with the Minister concerning the utilisation of such natural gas."*
>
> ***"Marketing authorisation***
>
> *42. The State authorises the Joint Venturers and each of them subject to the provisions of this Agreement and pursuant to recital (c) hereof to sell gas to the State Energy Commission and pursuant to such gas agreements with the State Energy Commission –*
>
> *(a) to market gas in the Pilbara to each of their affiliated companies and to major industrial customers who use more than 28 000 cubic metres of gas per day;*

(b) to sell or supply gas to each of their affiliated companies anywhere in Western Australia;

(c) to construct, finance and operate gas transmission pipelines to each of their customers in the Pilbara."

The benchmark price for domestic sales from the Joint Venture was set with a high weight given to domestic cost levels and competitiveness.

In terms of new fields in this century, the Western Australian Government has imposed a reservation policy where 15 per cent of the natural gas reserves are required to be used for domestic purposes.

The case is very different for Queensland. As of 2012 three major LNG plants are under construction in Gladstone on the Queensland central coast. These projects have been approved to proceed without any conditions or arrangements being put in place to generate supply at competitive prices to domestic gas users, whether they are heavy industrial users, commercial business, electricity generators or households.

With the advent of LNG projects the situation changed quickly for Queensland domestic gas customers and increasingly for large users across the east coast. Previously users were offered long-term contracts with predictable price settings. They could undertake long-term investments underpinned by a secure and cost-stable energy supply.

Currently, long-term contracts have "evaporated" as the first priority of gas producers is to secure supply for their LNG plants. Domestic customers feel the domestic market is now the residual sector, allocated what is surplus to requirements for the LNG plants, a reality which will become obvious once existing gas contracts end. Medium-term, let alone long-term, security of supply is no longer guaranteed. Domestic customers are now faced with the expectation having to pay the "net back" LNG price for natural gas, involving most probably a significant increase in price and, more importantly, the introduction of considerable price uncertainty derived from the unpredictability of the world gas market.

Admittedly, it is difficult to be precise about the calculation of 'net back' prices. Because of the variation in contract arrangements between LNG projects, the concept of a world LNG price is difficult to apply and actual prices will be determined by specific contract provisions. The provisions may or may not relate to LNG prices from other sources, either in Australia or overseas.

However, the concept of a domestic gas price based on a 'net back' price for LNG may not be the only factor leading to increased and more variable prices. Domestic consumers expect that the large impact of LNG demand on reserves will force domestic supply to be sourced from fields with higher extraction costs and, therefore, higher domestic cost. Since the majority of gas reserves are leased by interested parties focussed on LNG, it now appears likely that the domestic customers will be matched to the marginal increment in gross supply costs.

This is an extraordinary state of affairs given the scale of the projects and scale of the impact on the existing Australian identified reserves of natural gas. In the application of the national interest test to the projects which governments are obliged to do as manager of the resource on behalf of the community, it appears unlikely that the impacts of the LNG projects on domestic gas using industries have been considered to any great extent. This has been done in private sector reports, such as "*Carbon Market Economics – The Impact of Liquefied Natural Gas on Queensland Gas markets and Gas Users*", March 2010, with to date little impact in changing arrangements.

Australian natural gas (identified and potential) reserves are owned by the Crown which obliges the government of the day to determine when and how the resources are to be used. In exercising this duty, the government has a responsibility to optimise the benefit which current and future generators obtain from the extraction of the resources. Under the Australian constitution there are Federal/State Government jurisdiction issues as to who is responsible, but the reality is that all areas of Government need to cooperate to solve the problem.

1.2 Study objective

Accordingly, the study objective is to:

(i) outline a framework for testing the national interest benefit of Eastern Australian LNG projects that should be applied by the responsible Governments;

(ii) apply the framework to assess the net benefits that are likely to be obtained from the current projects under the current terms and conditions of their approval; and

(iii) evaluate the impact of alternative terms and conditions, in terms of assessing whether or not the net benefits assessed in (ii) can be significantly increased.

In short, this report complements the *Carbon Market Economics* (CME) report by quantifying the macroeconomic costs of a less than satisfactory (that is deficient) national interest evaluation and appropriate complementary policy design.

1.3 The LNG industry evaluated by this study

The LNG industry evaluated by this national interest evaluation is LNG exports from Queensland. The question at issue is whether Australia will obtain a net benefit from expected exports of LNG from Queensland. The expansion profile assumed in the quantitative analysis of the issue is:

Exports of LNG from Queensland
(million tonnes)

2015	2
2016	15
2017	18
2018	20
2019	20
2020	20
2021	20
2022	20
2023	24

In simple terms, therefore, the study will attempt to answer the question of whether or not Australia will obtain a net benefit from 24 million tonnes per annum of natural gas export from Queensland.

1.4 Why the focus on East Coast LNG?

The focus on East Coast LNG is because:

(i) the Western Australian market is not connected to the integrated gas market of the Eastern Australian states (which for this purpose include South Australia but not the Northern Territory) and

(ii) Western Australia has a domestic reservation policy for natural gas and the eastern states do not.

Because of the inter-connection between the eastern states' markets, the East Coast LNG plants will affect the majority of the Australian economy.

In short, given the conditions under which the Queensland projects were allowed to proceed, it is these projects that are most likely to fail a comprehensive national interest test.

1.5 Construction impacts

This study focuses on the production impacts on the economy. The construction impacts of new capacity required to support the changes is ignored as there is no suggestion that the LNG projects should not proceed but the focus should be on ensuring there is ample gas for the domestic sector.

2. The national interest evaluation framework, indicators and methodology

Under Australian law, Australia's petroleum (including natural gas) resources (and mineral resources) are owned by the Crown, in some cases in the right of the states and territories and in some cases in the right of the Commonwealth. In the words of the Productivity Commission, governments should exercise stewardship over Crown resources, managing them to achieve maximum overall benefits for the community. As the Productivity Commission notes, management should not simply be focussed on economic benefits but should also take into account objectives such as the protection of health, the environment and heritage. In general terms, the governance requirement is expressed as the Government's responsibility to make decisions on:

- how;
- when; and
- on what terms,

the petroleum resources are extracted, in terms of maximising the national interest.

Although the national interest test is required in legislation, for example, for assessing foreign investment proposals, Australian Governments have not explicitly stated what guidelines should be applied in balancing the economic, environment, strategic or social interests that constitute the national interest. While this allows regulatory bodies to operate with maximum flexibility, it also shields their decisions from evaluation in terms of explicit criteria.

2.1 The national interest test

The latest statement on the national interest test was made on behalf of the Australian Government by the Treasurer.[1] The statement applies to foreign investment but would be equally relevant to resource management decisions, and not only for the reason that most resource management decisions have a foreign investment component. The statement runs as follows.

2.1.1 What are the characteristics of investment proposals that are likely to be approved

The Government is making sure investments are not contrary to the national interest. If an investment is contrary to the national interest, the Government will intervene. This occurs infrequently.

What is contrary to the national interest cannot be answered with hard and fast rules. Attempting to do so can prohibit beneficial investments and that is not the intention of our regime. Australia's case-by-case approach maximises investment flows while protecting Australia's national interest.

[1] The Treasurer of Australia, "*Australian Foreign Investment Policy*", January 2012.

2.1.2 What are the national interest considerations

Assessing the national interest allows the Government to balance potential sensitivities against the benefits of foreign investment.

The Government determines national interest concerns case-by-case. We look at a range of factors and the relative importance of these can vary depending upon the nature of the target enterprise. Investments in enterprises that are large employers or that have significant market share may raise more sensitivities than investments in smaller enterprises. However, investments in small enterprises with unique assets or in sensitive industries may also raise concerns.

The impact of the investment is also a consideration. An investment that enhances economic activity – such as by developing additional productive capacity or new technology – is less likely to be contrary to the national interest.

The Government typically considers the following factors when assessing foreign investment proposals.

National Security

The Government considers the extent to which investments affect Australia's ability to protect its strategic and security interests. The Government relies on advice from the relevant national security agencies for assessments as to whether an investment raises national security issues.

Competition

The Government favours diversity of ownership within Australian industries and sectors to promote healthy competition. The Government considers whether a proposed investment may result in an investor gaining control over market pricing and production of a good or service in Australia. For example, the Government will carefully consider a proposal that involves a customer of a product gaining control over an existing Australian producer of the product, particularly if it involves a significant producer.

The Government may also consider the impact that a proposed investment has on the make-up of the relevant global industry, particularly where concentration could lead to distortions to competitive market outcomes. A particular concern is the extent to which an investment may allow an investor to control the global supply of a product or service.

The Australian Competition and Consumer Commission (ACCC) also examines competition issues in accordance with Australia's competition policy regime. Any such examination is independent of Australia's foreign investment regime.

Other Australian Government Policies (Including Tax)

The Government considers the impact of a foreign investment proposal on Australian tax revenues. Investments must also be consistent with the Government's objectives in relation to matters such as environmental impact.

Impact on the Economy and the Community

The Government considers the impact of the investment on the general economy. The Government will consider the impact of any plans to restructure an Australian enterprise following an acquisition. It also considers the nature of the funding of the acquisition and what level of Australian participation in the enterprise will remain after the foreign investment occurs, as well as the interests of employees, creditors and other stakeholders.

The Government considers the extent to which the investor will develop the project and ensure a fair return for the Australian people. The investment should also be consistent with the Government's aim of ensuring that Australia remains a reliable supplier to all customers in the future.

Though the national interest is defined broadly, possible negative spillover effects of any specific investment on other industries are not explicitly considered.

2.2 A qualification of the national interest test: The guidelines used for this study

(i) Net economic benefit

The project should make a significant net benefit to cumulative economic activity over its life including the construction phase.

(ii) Significant medium-term benefits

In order to ensure that the benefits are not delayed beyond the living spans of a significant proportion of the current living population, at least one third of the net benefits should be achieved within the first 10 years of the life of the operations of the project.

(iii) Strengthening the skill base of the economy

The project should, net, strengthen the skills base of the economy as measured by the skill intensity of demand for labour.

(iv) There is a significant net impact on Government revenues

In order for the benefits of resources to be distributed to the broader community, Governments need a significant revenue base to distribution. Therefore, a necessary requirement would be that the discounted Government revenue from the project be greater than what would be achieved from an expansion in the general economy.

(v) Australia's economic security

One requirement here, in general terms, would be for the economy to be able to withstand negative economic shocks better than would have been the case in the absence of the project. Australia's relatively secure open economy is subject to shocks in the form of sudden and adverse movements in terms of trade (commodity prices) and the exchange rate. It is desirable, therefore, that the project should reduce the economic costs of adverse commodity prices and exchange rates.

(vi) Australian political security is enhanced

It is desirable that the project should not promote economic dependence on any particular trade partner or closely-allied group of partners.

2.3 The national interest evaluation: Its importance in optimising national benefits

The decision to allow an individual LNG project to proceed or not, in terms of the national interest test, would depend on whether or not the expected net economic, environmental and security outcomes are significantly positive. The project would only be allowed to proceed if it was deemed likely to yield greater national benefit compared to denial of approval.

In most cases, however, it will not be a simple case of a go/no go decision. The national interest evaluation process will frequently identify negative outcomes which can be remedied either by changes in the particular project or by more general policy changes, unrelated to the particular project, which will increase the benefits generated by the project. These complementary policies or other changes may change the status of a project from 'no go' to a strong positive national interest return, and will frequently include strategies to minimise the costs which the project imposes on other industries. A rigorous national interest evaluation process is therefore in itself an instrument to maximise national benefit.

2.4 The benefit indicator

After the design of the national interest evaluation framework, the next most important decision is the selection of the core indicator for evaluating net benefits. In general terms the benefit indicator selected should measure that part of the flow of production that is available to support expenditures in the national economy that directly contribute to welfare/happiness. In the absence of direct measures of welfare, it is usual to concentrate on the flows of funds available to citizens for expenditure on meeting their needs and wants. We are therefore seeking within the constraints of available data for a benefit indicator of sustainable consumption.

A range of indicators is commonly used when measuring the impact of an investment on economic activity, including:

- gross domestic product;
- gross national product (gross domestic income); and
- net national product (net domestic income).

The bracketed name is what the series is now called in the Australian National Accounts. The original names are retained in this study because they clearly signal that the indicators have the same status as GDP whereas the new names imply a lower status. Gross domestic product is the value added generated in a given jurisdiction, irrespective of where the income is distributed. Gross national product (gross domestic income) is GDP less that part of GDP that is distributed to foreign residents or companies in the form of interest, dividends and undistributed income. Net national product is gross national product less that part of value added that is allocated to depreciation expenses. The last is the most appropriate to use in evaluating the benefits of investments in the gas industry for two reasons.

- high foreign ownership in the industry (one of the three LNG export terminals currently under construction at Gladstone is wholly overseas owned and the other two are joint ventures with substantial overseas participation); and

- very high depreciation charges (the bulk of depreciation expense occurs in the first half of the project life and much of it is returned overseas to repay debt).

Because of overseas ownership and high depreciation, the GDP indicator gives a very misleading indication of the benefits of LNG plants.

Given a regard for national welfare, the benefit indicator on which all national interest evaluations should be based should be either net national product (net disposable income) or direct estimates of sustainable private and public consumption expenditure impacts, which can be approximated by consumption expenditure plus total taxation revenue. Both NNP and consumption plus tax revenue are reasonably good proxies for sustainable consumption. Accordingly, for this study, the benefit indicator is taken to be an average of the two measures, that is, the sum of NNP plus private consumption expenditure plus taxation revenue divided by two.

2.5 A probability approach needs to be built into the evaluation framework

A probability approach is required for this study and for testing the implications of a project's approval by regulators. For this study a range of parameters have to be quantified with values around which there is a great deal of uncertainty not only in terms of current settings but also what the values may be over a 20 to 30 year time horizon.

Regulators are able to assess more accurately current information in regard to particular projects if only for the reason that it will be contained in the supporting documentation required for the approval process. In terms of the future values of required parameters, this will require judgement based on the best available current information. In this case, it would be useful for regulators to adopt a probability approach which requires the explicit setting of the characteristics of the probability distribution around key parameters.

This also fits into the general bottom line reality of assessments. Because of uncertainty, the best that any national interest assessment can conclude is that "*on the balance of probabilities it is concluded that .....*". By specifying probability distributions of the key parameters that determine the overall outcomes, the degree of uncertainty surrounding a decision for a project to proceed or not, or surrounding the conditions imposed on project approval, can be communicated to the general public. This eliminates the need for regulators to have a non-transparent and flexible definition of how the national interest is to be assessed.

Further, it can be more difficult to interrogate modelling results, and minor differences in assumptions can lead to big differences in outcomes. This worry is blunted if a probabilistic framework is adopted since, if results are sensitive to certain parameter specifications, this will be indicated by a high probability distribution range around the bottom line evaluation indicators.

In the present study, all relevant data and relationships used in the calculations for the national interest evaluation are included to readers to cross check the conclusions.

2.6 The quantification of risk – the Trigen distribution

For this study the probability distribution selected to quantify risk is the Trigen distribution. This distribution is selected because its parameters are easily related to the conditions that the probability distribution is describing.

To apply a Trigen probability distribution five parameters have to be specified. They are:

(i) the lower bound of the parameter/indicator;

(ii) the mode value of the parameter/indicator;

(iii) the upper bound value of the parameter/indicator;

(iv) the probability that values less the lower bound values will be taken; and

(v) the probability that values less than the upper bound value will be taken.

The approach will be illustrated for perhaps the most important input indicator for this study which has a high level of uncertainty. This indicator is the total remaining identified and undiscovered reserves of natural gas. As shorthand, these reserves are often referred to as remaining reserves. Chapter 6 below nominates the lower bound and upper bound values based on the estimates of others.

Figure 2.1: Trigen probability distribution for remaining reserves

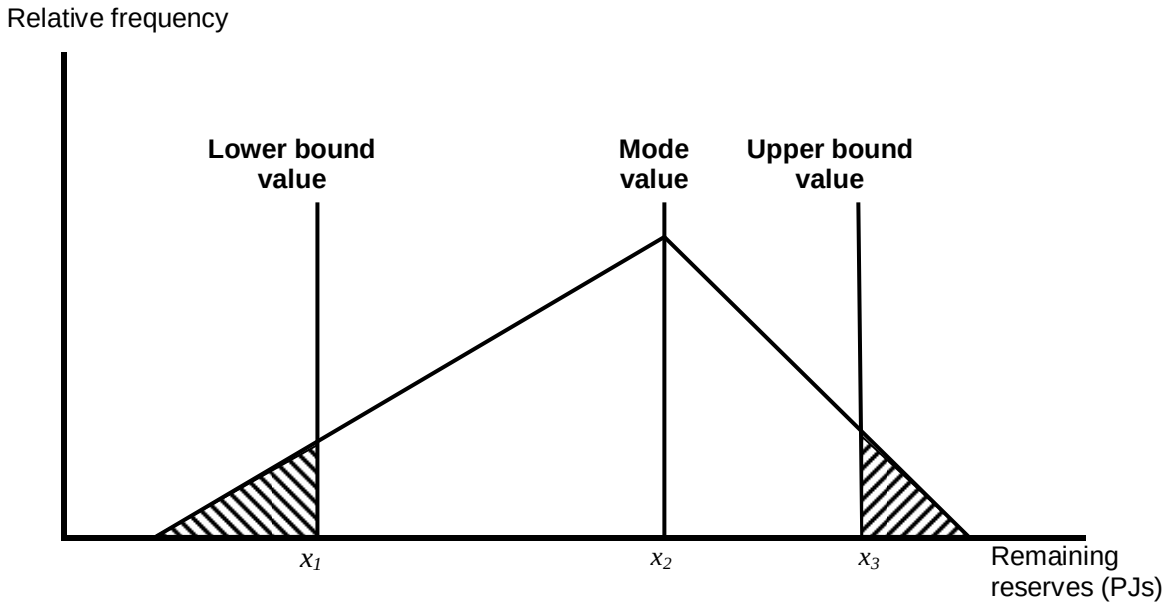


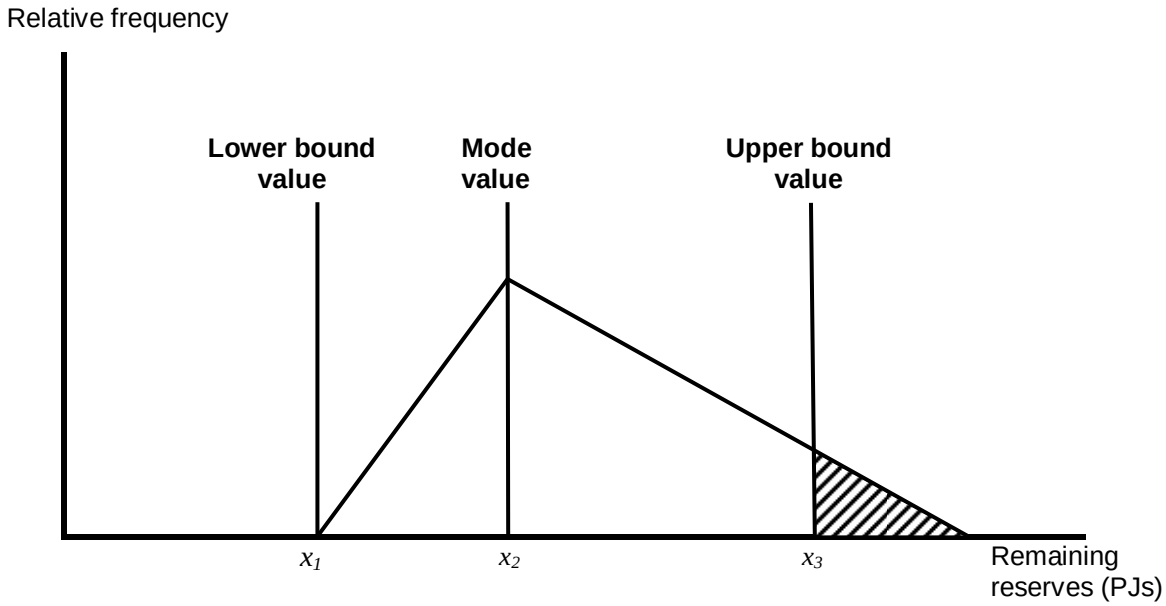
Figure 2.1 illustrates this case. Remaining reserves are measured in petajoules (PJs). The remaining reserves, in terms of lower bound (x_1), mode (x_2) and upper bound values (x_3) are selected on the best available information. If the upper bound probability is set at 100, then there will be no shaded area for the upper bound value. However, if it was considered that the probability of finding more reserves than the upper bound value, then the upper bound probability might be set at 80 per cent with the shaded area in the figure representing a probability of 20 per cent.

The same concepts apply to the lower bound values. For this study the lower bound probability is set at zero, meaning that there is no probability of the lower bound value taking lower values.

The mode can be selected on the basis of whether an upward or downward bias is to be imposed after consideration of upside and downside risks.

Figure 2.2 illustrates the case where the downside risks are considered dominant. Also, the lower bound probability is set at zero.

Figure 2.2: Trigen probability distribution for remaining reserves



2.7 The spillover impacts on other industries

A deficient national interest test would focus on the value of a project with little or no testing of the implications for other industries.

Comprehensive economic national interest testing examines how the project will impact other industries both positively and negatively. Comprehensive national interest testing, therefore, focuses not on the gross benefit of a project but the net impact after taking into account both negative and positive impacts on other industries.

3. LNG export expansion – channels of costs imposed on non-resource industries

LNG expansion can impose costs on other industries. Although a range of transmission channels may be relevant, the costs generally take the form of reductions in the level of output in other industries, sometimes referred to as crowding out. In a fully-employed economy some level of crowding out is inevitable if new projects are to proceed; the question is then whether the benefits from the new project exceed those lost through crowding out. In economies which are less than fully employed opportunities may exist to resource the new project without crowding out, in which case the potential benefits are considerable. However, there is also a possibility that projects will be implemented in ways which cause unnecessary crowding-out.

The discussion here is in qualitative terms and takes LNG expansion as a particular case of resource industry expansion. Although agriculture is also a resource industry, in the context of this chapter the term exclusively applies to the resource extraction industry. In ABS terminology the resource extraction industry is called mining and includes all activities which extract subsurface mineral resources other than water.

3.1 Macroeconomic resource (labour) constraints: Non-resource industry crowding out

Macroeconomic resource constraints apply to any LNG project planned for an economy which would otherwise be operating with full utilisation of resources, or which would reach full resource utilisation in the event of the project proceeding. Full utilisation can apply in both the construction and production phases of the project, and may apply to the economy as a whole or to particular inputs or geographic areas. If the project is to divert inputs from other uses the following tests must return positive answers if the project is to yield net benefits at the national level. (The tests are specified in terms of labour, but can be re-phrased to apply to any other diverted inputs such as office space). The first test is relatively simple: gross product, real wages and Government tax per hour worked by marginal workers transferred into the project are greater than gross product, real wages and taxes per hour worked by marginal workers in the industries from which they are displaced. The second test recognises that labour displacement will be accompanied by a gradual process of capital displacement, particularly during the construction phase, during which capacity-enhancing investment in the non-resource industries will be crowded out by resource project investment. The second test requires that the foregone productivity-enhancing effects of the crowded out investment does not reverse the first test.

Though these tests are conveniently specified in terms of labour, it should be remembered that Australia has a long history of alleviation of labour shortages through increased immigration. The chief concern, therefore, has to be crowded-out investment.

3.2 The drivers of manufacturing expansion

Relative costs are important in the sense that manufacturing will contract if there is too great a gap between domestic and foreign costs of production. However, even if relative costs are comparable and Australian products have a price edge (as when the actual $A/$US exchange rate is below its Purchasing Power Parity level) manufacturing expansion still depends on producers' ability to gain a competitive edge by product differentiation in terms of the design, functionality, durability, etc. of their products. This requires years of lead time in research and development and marketing efforts and also requires time to finance innovation and new capacity involving the latest technology and so on. The efforts of a firm to adopt best practice production technology, innovate via research and development expenditures and develop new markets are all part of either achieving competitive edge product differentiation or identifying opportunities for greater exploitation of existing advantages.

In the typical manufacturing industry the individual producer creates or maintains a market while in the resource extraction industry the producer responds to the market. This is why differentiated product manufacturing is riskier than most other industries. An important aspect of this higher level of risk is that differentiated product manufacturers have to create their own finance for expansion whereas in resource extraction industries this finance is delivered by the market.

At the macroeconomic level the different drivers of the resource extraction industry versus manufacturing expansion can lead to a conflict between manufacturing expansion and equivalent resource extraction industry expansion that is unrelated to issues of national resource availability. This is because the higher terms of trade effect associated with resource extraction industry expansion crowds out manufacturing activity through exchange rate impacts. The converse negative impact on the resource extraction industry from manufacturing expansion is much weaker because manufacturing expansion does not influence the terms of trade.

The most important dynamic is one of cumulative causation. Success in sustained manufacturing expansion depends on an uninterrupted sequence of steps that are resourced adequately and are consistent with market requirements.

Periods of highly over-valued exchange rates associated with elevated resource extraction industry activity intensity are very destructive for manufacturing. This is because high relative costs, in conjunction with already high risks, lead producers to curtail or end new development initiatives. Research and development (R&D) is scaled back and capacity expansion and replacement decisions are postponed, which leads to producers falling further behind their competitors in other countries. When the period of elevated resource extraction investment ends and the exchange rate falls back to cost parity levels domestic competitors are too far behind to restart R&D programs or even, in some cases, to undertake the replacement investment required to ensure long term business sustainability. The same adjustment process occurs, though less severely in terms of the long run negative outcomes, for other trade-exposed industries such as differentiated agriculture, high value business services industries, tourist industries and export-oriented segments of the health and education industries.

In general, a floating exchange rate protects the resource extraction industry in both the expansion and stability phase of the resource price cycle. For manufacturing and other trade exposed industries, positive stimulus to growth mainly comes in periods of low resource prices and hence low exchange rates. However the strength of this positive stimulus to growth is likely to be weak under the following conditions:

(i) if the period of low commodity prices corresponds to a period of relatively low world growth and low expectations of future growth; and

(ii) if a history of high exchange rates during past mining booms has generated expectations of future episodes, leading potential investors to discount the benefits of a current relatively low exchange rate heavily when they calculate the expected future returns on investment. They will not expect the exchange to remain low for very long.

Repeated episodes of resource extraction industry expansion lead to expectations of increasing volatility and the requirement of high short-term returns on investment.

National interest testing of a project's impact on economic security should cover a number of components, including, inter alia trade dependency and resilience to economic shocks.

3.2.1 Economic security: Trade dependency

It is not in an exporting country's national interest to become over-dependent for its exports on any other country. Over-dependence means that if the importing country's economic prospects decline rapidly it will force a significant decline in economic activity on the exporting country. There is also a risk that such trade dependency might be used by the importing country to force political and economic decisions on the exporting country even when they are costly in terms of the latter's national interest.

3.2.2 Economic security and the national interest: Resilience to economic shocks

One of the economic security components of national interest evaluation is the resilience to economic shocks test. If project proceeds, the project should not increase the security risk of the economy to a negative economic shock and, in particular, an exchange rate shock.

The one thing that is certain about any period of strong expansion in resource development is that it will end. More often than not the ending will be characterised by a rapid fall in commodity prices, closely followed by a fall in the exchange rate. This will lead to a widening of the current account deficit which in the Australian case is likely to be unsustainable given that, even with relatively high terms of trade, Australia's current account deficit is likely to be around 5-8 per cent of GDP circa 2016-2020.

The national interest evaluation would require that the following questions be answered.

(i) What is a plausible lower limit for commodity prices at the end of the current resource extraction industry expansion?

(ii) Assuming that the exchange rate falls in proportion to the commodity price fall, what would be the direct impact on:

- domestic inflation rates; and
- the current account deficit?

(iii) How much will national economic activity have to contract to return the inflation rate to desired levels? (The assumption here is that increases in unemployment rates are required to reduce the rate of growth of nominal wages and hence of costs and prices.)

(iv) In terms of (iii), does the project under consideration increase or reduce the contraction in economic activity necessary to bring inflation under control during a period of falling exchange rates?

(v) To what extent are import and export responses to the exchange rate devaluation likely to reduce the initial current account deficit after a reasonable time, say three years? What will be the contribution of the project to these responses?

(vi) Given the outcome of (v), what is the contraction in output required to restore the current account deficit to sustainable levels?

(vii) Given the outcome of (vi) does the go-ahead of the project under evaluation add to or reduce the contraction in economic activity required to restore the current account deficit to acceptable levels?

The national interest test would then compare the calculations from (iv) and (vii). If one or both answers were negative the project would fail the national interest test because it reduced the resilience of the economy to economic shocks. Failure of these tests means that the project could increase the contractions in the level of general economic activity required to achieve satisfactory inflation or balance of payments outcomes during the last phase of an episode of elevated resource expansion, the period of the return to stability.

3.3 Microeconomic resource constraints: Industry crowding out

As distinct from macroeconomic resource constraints, microeconomic resource constraints, resulting from projects proceeding, can impose costs on specific industries by limiting the growth in, or reducing the availability of, key resource inputs which cannot be effectively substituted with other inputs. In this case the industries affected have no option but to reduce actual or planned output in proportion with the actual or expected reduction in key input supply – a process which can easily lead to unemployment of other inputs.

For the case of LNG projects requiring large scale access to natural gas reserves, the impact on the future availability of gas will affect actual and expected investment, output and employment decisions in directly affected industries, especially heavy industry and electricity generation.

The chemical and alumina industries depend on the availability of gas at competitive prices. One or two LNG projects may not undermine confidence in the future availability of gas provided that expected gas reserves are adequate. However, with three and perhaps four additional LNG plants to come online over the next few years, along with projected expansion in the capacity of these plants, it is becoming clear that the combined claims on gas resources may lead to gas supply constraints in the eastern Australian gas market which will almost certainly lead to increasing expectations of real gas cost rises as higher costs of extraction are encountered in exploiting Australia's remaining resources of natural gas. The expectation of rising gas prices will reduce the willingness of producers in the chemical and alumina industries both to maintain the competitiveness of their current plants and to invest in additional capacity. This change in expectations could trigger a long-term decline in these industries which will be accelerated if expectations of gas shortages to domestic users take hold.

Because of the importance of the downstream gas-user industries in Australia's industrial structure and their recent growth performance, the impact of LNG export proposals on domestic users would have to be at the centre of any national interest evaluation for any

valid determination of net project benefits. The critical indicator to focus on in this component of the national interest test is the ratio of annual natural gas demand (including all approved LNG plans) to estimated remaining reserves. If this ratio falls below acceptable levels then substantial microeconomic crowding out is likely to eventuate at some point over the project's life.

Microeconomic crowding out is analysed in Chapters 4 to 7 below.

3.4 Electricity price impacts

A further avenue of impact from LNG expansion lies in the implications for wholesale electricity prices that result from greatly elevated natural gas prices. Gas powered generation already plays a significant role in the electricity market, particularly in meeting peak demand, and its role is expected to grow both to provide backup to variable renewable generation and to provide relatively low-emissions base load. At peak times highly responsive Open Cycle Gas Turbines (OCGT) frequently set the wholesale price in the National Electricity Market and increased fuel costs can be expected to flow directly through to higher prices in that market. A 2010 AGL study found a $35 per megawatt hour difference in the marginal running costs of OCGT between a gas price scenario of $3.60 per GJ and one at $6.75.[2] These increases will flow through to almost all consumers, while those businesses who have moved to insulate themselves from rising electricity prices by installing highly efficient gas-fired cogeneration systems in recent years will find themselves subject to the same fuel price pressures.

[2] Paul Simshauser, Tim Nelson and Thao Doan, *The Boomerang Paradox, Part 1* (October 2010) http://www.aglblog.com.au/wp-content/uploads/2010/10/No.17-Boomerang-Paradox-Final-Oct-20101.pdf.

4. The natural gas usage trade-off: Domestic allocation versus export use – the case of natural gas dependent industries

Central to the application of the national interest test will be the direct economic value of a given quantity of natural gas from LNG exports versus the economic value of the same quantity of gas produced from domestic use. The net value of this comparison is a key estimate because:

(i) it indicates the cost of supply shortages if the export of gas has supply preference over domestic users; and

(ii) a high economic value for gas for domestic use entails that it is in the national interest that confidence in the adequacy of future domestic gas supplies at competitive prices ought not to be undermined by inappropriate exports.

The value of the trade-off will be assessed from two perspectives, namely:

(i) gas dependent industries; and

(ii) the non-resource economy excluding agriculture and mining.

The case of natural gas dependent industries is considered in this chapter and the broader economy-wide industry effects will be considered in the next chapter.

Natural gas dependent industries are industries where a large part of total output depends on the availability of natural gas at relatively low prices. These industries are the chemical sector and the non-ferrous basic metals industries (particularly alumina production).

To calculate the net value trade off for a given quantity of natural gas we estimate the value of current output of these industries that, in the long-term, would be curtailed if the supply of natural gas to these industries ended, or alternatively if supply was available only at such prohibitive prices that the industries became uncompetitive and retreated offshore.

4.1 Natural gas dependent industries: The direct value of natural gas availability

The chemical sector consists of the following major industries:

- basic chemicals;
- paints;
- pharmaceuticals;
- soap and detergents;
- cosmetics;
- other chemicals;
- rubber products; and
- plastic products.

There are other industries where the dependency on natural gas is high enough to justify the assumption that a substantial part of these industries, in the current environment, would not exist without reliable supplies of natural gas at competitive prices. These industries include glass and cement. The electricity sector is also becoming dependent on natural gas for peak power generation and increasingly for base load; this dependence will likely increase with the growth of renewables. The concentration of the present study on non-ferrous metals and chemicals to assess the cost of diversion of gas to LNG exports does not imply that other industries are unaffected. As long as the other affected industries have smaller economic values for gas the marginal cost of gas diversion is determined by the analysed industries.

The assumption in this study is that if natural gas was no longer available, the bulk of the basic chemicals industry would cease to operate, not necessarily overnight, but over time. The basic chemical industry was established in Australia before adequate supplies of natural gas became available. However, this was driven by factors including security objectives arising during and from World War II and high levels of tariff protection and subsidies. These no longer exist. More importantly, it was established at a time when other countries with large scale chemical industries also had limited or no supply of natural gas. The widespread availability of natural gas over the last half century has meant that the technological base of the industry has changed radically so that now a world competitive industry perforce relies on natural gas.

Other industries in the chemical sector rely on the presence of a local basic chemicals industry at the head of their supply chain and part of these industries would not exist without the availability of domestic basic chemical products. Accordingly the basic chemical industry generates a supply multiplier through the rest of the chemical sector. The question is how big is this multiplier effect? This multiplier effect was estimated by the following steps:

(i) using input-output table $m flows to calculate the share of product from the basic chemical industry used in the other seven chemical industries listed above as a percentage of output of each industry;

(ii) find the industry with the highest share of basic chemical products and nominate that share of this industry that would not exist in the long-run without the local availability of supply from the basic chemical industry. This nomination is termed the maximum basic chemical industry dependency ratio;

(iii) extend this nomination to the other chemical industries dependent on the basic chemical industry as the maximum basic chemical industry dependency rate multiplied by the basic chemical input share of the industry being estimated, divided by the basic chemical industry input share from (ii), or for that industry with the maximum basic chemical industry dependency ratio;

(iv) divide the results from (ii) for each industry by the basic chemical sector industry; and

(v) sum the results of (iv) across all the chemical industries to give the basic chemical industry multiplier, with a multiplier of unity for the basic chemical industry itself.

Table 4.1 gives the results of the calculation for Australia in 2008-09. The highest input ratio is for the plastics industry and the maximum basic chemical dependency ratio for this industry is nominated at 60 per cent. From this flows the multiplier estimates by industry shown in the second column of the table. The total multiplier value is 1.6.

Table 4.1 The chemical industry basic chemical multiplier		
	Input from basic chemicals – ratio of output	**Basic chemical sector – output multiplier**
Basic chemicals	0.12	1.00
Paints	0.05	0.02
Pharmaceutical products	0.01	0.04
Soap and detergents	0.06	0.01
Cosmetics	0.06	0.01
Other chemicals	0.07	0.07
Rubber products	0.02	0.01
Plastic products	0.13	0.44
Total	**–**	**1.60**

4.1.1 The importance of the local supply chain

It may be asserted that Australia's non-basic chemical enterprises would be best served by securing basic chemical inputs from anywhere in the world so long as they are at lowest cost and that a local basic chemicals industry is therefore not important. This view is wrong. The benefits of the local supply chain come from:

(i) just-in-time manufacturing capability;

(ii) manufacture of product that is required by the particular production technologies and product types produced by the local industry (these are not fully available elsewhere in the world);

(iii) security of supply; and

(iv) mutual dependency placing upper limits on price settings.

In this context, the multiplier value of Table 4.1 could be considered as being too low.

4.1.2 The non-ferrous metals industry

The non-ferrous metals industry consists of the alumina, aluminium and other processing industries, such as zinc, nickel, etc. Most certainly the alumina industry would not exist without the availability of natural gas, and almost certainly part of the aluminium industry would not exist without the availability of a strong local supply chain extending from bauxite to alumina and finally to aluminium.

Accordingly, the assumption adopted here is that half the Australian non-ferrous basic metals industry would not exist without the availability of plentiful natural gas supplies at reasonable prices.

4.1.3 Natural gas dependent industries: The direct value estimates

Given the above methodology, Table 4.2 profiles the direct benefit Australia receives from the supply of natural gas to the local gas-dependent industries. The estimates are in terms of $m of output per petajoule (PJ) of natural gas input.

Table 4.2	The direct benefit to Australia per PJ of natural gas – natural gas dependent industries (2008-09)
	$m
Non-ferrous metals	
Output per PJ	476
Adjusted output per PJ	238
Chemical sector ($m per PJ)	
Basic chemicals	168
Paints	3.9
Pharmaceuticals	4.0
Soaps and detergents	6.4
Cosmetics	2.2
Other chemical products	11.6
Rubber products	1.6
Plastic products	73.9
Total	**271.6**
LNG exports	**11.5**

The total value of a PJ of natural gas into the basic chemical industry, given the spillover benefits from the other industries, comes to $271 million per PJ. This is in accordance with the 1.6 multiplier developed above for the chemical sector.

The PJ value for LNG exports over the fiscal years from 2009 to 2011 has averaged $11.5 million. It is extremely important to recognise that this exported gas was sourced without affecting supply to domestic industrial users. The trade-off ratio means that if 1 PJ is instead shifted from local use by gas-dependent industries to export, the result is a direct loss of gross output of (averaging the basic metals and chemical sector estimates) of $255 million, compared to a $12 million gain from export revenues. The direct net loss in Australian value added is $243 million, or a loss/benefit ratio of 21 to 1.

This by itself would justify a national interest evaluation methodology which investigates whether local industry has an adequate supply of gas for the next two to four decades and approves LNG plants only when they can be supplied without affecting supply and price to domestic users. The fact that this evaluation is so compelling suggests that no such evaluation has been applied in national interest assessment to date. However, to be secure in this conclusion a further analysis needs to be undertaken, placing the direct estimates in the context of an input-output framework for the total national economy, incorporating into the analysis parameters reflecting differentials in the depreciation rates, tax rates and foreign ownership rates between industries, and assessing the net impact on the indicators selected as appropriate for national interest evaluations.

4.2 The input-output modelling framework

To evaluate the issue further, it is necessary to adopt a mixed demand-supply constrained input-output framework. This is because the existence of gas dependent industries means that these industries' activity levels are determined not simply by demand, but by whether or not there is an adequate supply of natural gas at reasonable prices to support domestic supply expansion where this is required to accommodate an increase in demand.

Let x_i represent (gross) output of industry i.

The economy consists of n industries, of which m industries are supply constrained by the availability of natural gas. By supply constrained is meant that they cannot automatically respond to demand changes unless the natural gas industry decides to provide the required inputs of (in this case) natural gas without major price increases.

The input-output relationship for the case where no industry is constrained is:

$$\begin{pmatrix} x_1 \\ \vdots \\ x_m \\ \cdots\cdots \\ x_{m+1} \\ \vdots \\ \vdots \\ \vdots \\ \vdots \\ x_n \end{pmatrix} = \begin{pmatrix} a_1 & \cdots\cdots & a_{1,m} \\ \vdots & & \vdots \\ a_{m,1} & \cdots\cdots & a_{m,n} \\ \cdots\cdots & & \cdots\cdots \\ a_{m+1,1} & \cdots\cdots & a_{m+1,n} \\ \vdots & & \vdots \\ \vdots & & \vdots \\ \vdots & & \vdots \\ \vdots & & \vdots \\ a_{n,1} & \cdots\cdots & a_{m,n} \end{pmatrix} \begin{pmatrix} x_1 \\ \vdots \\ x_m \\ \\ x_{m+1} \\ \vdots \\ \vdots \\ \vdots \\ \vdots \\ x_n \end{pmatrix}$$

$$+ \begin{pmatrix} c_1 & \cdots\cdots & c_{1,n} \\ \vdots & & \vdots \\ \vdots & & \vdots \\ c_{m,1} & & c_{m,n} \\ c_{m+1,1} & & c_{m+1,n} \\ \vdots & & \vdots \\ \vdots & & \vdots \\ \vdots & & \vdots \\ \vdots & & \vdots \\ c_{n,1} & \cdots\cdots & c_{m,n} \end{pmatrix} \begin{pmatrix} x_1 \\ \vdots \\ \vdots \\ x_m \\ x_{m+1} \\ \vdots \\ \vdots \\ \vdots \\ \vdots \\ x_n \end{pmatrix}$$

$$+ \begin{pmatrix} f_1 \\ \vdots \\ \vdots \\ f_m \\ f_{m+1} \\ \vdots \\ \vdots \\ \vdots \\ \vdots \\ f_n \end{pmatrix}$$

Given that x_1 to x_m are constrained, the (4.1) can be rewritten as:

$$\begin{pmatrix} x_{m+1} \\ \vdots \\ \vdots \\ \vdots \\ x_n \end{pmatrix} = \begin{pmatrix} a_{m+1,1} & \cdots & a_{m+1,m} \\ \vdots & & \vdots \\ \vdots & & \vdots \\ \vdots & & \vdots \\ a_{n,1} & \cdots & a_{n,m} \end{pmatrix} \begin{pmatrix} x_1 \\ \vdots \\ \vdots \\ \vdots \\ x_m \end{pmatrix}$$

$$+ \begin{pmatrix} a_{n+1,m+1} & \cdots & a_{m+1,m} \\ \vdots & & \vdots \\ \vdots & & \vdots \\ \vdots & & \vdots \\ a_{n,m+1} & \cdots & a_{n,n} \end{pmatrix} \begin{pmatrix} x_{m+1} \\ \vdots \\ \vdots \\ \vdots \\ x_m \end{pmatrix}$$

$$+ \begin{pmatrix} c_{m+1,1} & \cdots & c_{m+1,m} \\ \vdots & & \vdots \\ \vdots & & \vdots \\ \vdots & & \vdots \\ c_{m,1} & \cdots & c_{n,m} \end{pmatrix} \begin{pmatrix} x_1 \\ \vdots \\ \vdots \\ \vdots \\ x_m \end{pmatrix}$$

$$+ \begin{pmatrix} c_{m+1,m+1} & \cdots & c_{m+1,n} \\ \vdots & & \vdots \\ \vdots & & \vdots \\ \vdots & & \vdots \\ c_{n,m+1} & \cdots & c_{n,n} \end{pmatrix} \begin{pmatrix} x_1 \\ \vdots \\ \vdots \\ \vdots \\ x_m \end{pmatrix}$$

$$+ \begin{pmatrix} f_{m+1} \\ \vdots \\ \vdots \\ \vdots \\ f_n \end{pmatrix}$$

Or in matrix form:

$$\boldsymbol{x^u} = \boldsymbol{A^c x^c + C^c x^c + A^u x^u + C^u x^u + f^u}$$

Where:

$$\boldsymbol{x^u} = \begin{pmatrix} x_{m+1} \\ \vdots \\ \vdots \\ \vdots \\ x_n \end{pmatrix}$$

$$\boldsymbol{x^c} = \begin{pmatrix} x_1 \\ \vdots \\ \vdots \\ \vdots \\ x_m \end{pmatrix}$$

$$\boldsymbol{f^u} = \begin{pmatrix} f_{m+1} \\ \vdots \\ \vdots \\ \vdots \\ f_n \end{pmatrix}$$

A^c = $(n - m) * m$ matrix of coefficient of inter-industry input-output coefficients.

A^u = $(n - m) * (n - m)$ coefficients of inter-industry input-output coefficients.

C^c = $(n - m) * m$ matrix of consumption output coefficients for constrained industries.

C^u = $(n - m) * (n - m)$ matrix of consumption output coefficients for unconstrained industries.

Unconstrained industry output is, therefore, given by:

$$\boldsymbol{x^u} = \boldsymbol{[I - A^u - C^u]^{-1}\,[A^c + C^c] + [I - A^u - C^u]^{-1}\,f^u}$$

Other indicators

Other indicators are given by the general form:

$$i_{o,j} = va_j \,.\, i^c_o\, x_j$$

Where:

$i_{o,j}$ = other indicator value (net national product, wage, salaries and mixed income, etc.) for industry j.

va_j = share of value added at factor cost to total gross output for industry j.

i^c_o = ratio of indicator o to value added (or gross surplus) for industry j.

x_j = total gross output for industry j.

The aggregate value across industries is given by:

$$i^t = \sum_{j-1}^{n} i_j$$

The key coefficients, i^c_o, are presented in Appendix B.

4.3 The input-output tables

The direct allocation of imports input-output table used for this study for 2008-09 is given in Appendix B. Other associated tables used are:

(i) the flow table with indirect allocation of imports;

(ii) the indirect tax flow table;

(iii) the import flow table as the difference between the Appendix B table and the indirect import table described in (i).

The key coefficients, tax, income, etc. by industry are also given in the table in Appendix B.

Adjustments are made to the coefficients given in Appendix B to better reflect the East Coast LNG industry as distinct from the offshore Western Australian industry, which is the only LNG industry reflected in the 2008-09 input-output tables. The main adjustment is to employment. The East Coast LNG industry is likely to be more labour intensive in operation due, in part, to its reliance on a land-based, dispersed natural gas collection and distribution system. As a result, the employment to output ratio is set at 0.19 or 60 per cent greater than the Western Australian average. Appropriate adjustments are made to other related parameters.

The foreign ownership ratio is also likely to be lower than for Western Australian projects. The average foreign ownership ratio for Queensland projects is set at 30 per cent.

The other issue is the tax rate. Once the Resource Rent Tax (RRT) becomes operational the ratio of direct tax to gross surplus will approach 50 per cent. However, this will not occur until towards 2030. In the early years, the tax rate will be negligible, rising to around 15 to 20 per cent once company tax rates become applicable. One way to account for this is to adjust the tax rates year by year, requiring all results to be presented in cumulative discounted terms only rather than as yearly average impacts. Accordingly, the tax rate is set at its average project level of around 35 cents in the dollar of gross surplus, which gives a significant upward bias to the benefits of LNG in the first half of a project's life.

4.4 The impact on the economy of LNG exports – a 50 PJ expansion

The model framework developed above will be used to assess the impact on the economy of a 50 PJ (approximately one million tonnes) LNG export expansion supplied at the expense of supply to domestic gas-dependent industries. The construction impacts are not considered.

In 2008-09 dollars, the additional gross output of LNG (and exports) comes to $620 million. Table A.1 indicates that GDP at market prices increases by $729 million, implying a standard multiplier of 1.2. However, the increase in net national product is half the increase in GDP. The increase in the benefit indicator is $401 million annually.

4.5 A 50 PJ contraction in natural gas supply to natural gas dependent industries

The second column in Table A.2 assumes that the 50 PJ expansion allocated to the LNG project is diverted from natural gas dependent industries. The reduction in gross output for the constrained industries given in Table A.2 runs to $12.8 billion in 2009 prices. This follows directly from the calculations given above on the assumption that 25 PJ is withdrawn from the non-ferrous metal industry and 25 PJ from the basic chemicals industry.

In this case the annual average loss in GDP at market prices is $11.0 billion, while total employment falls by 203,000 from what otherwise would have been the case. From column three of Table A.2 the gross negative from the natural gas withdrawal from natural gas dependent industries so overwhelms the positive impacts of LNG expansion that the net change between the two cases is close to the negative impacts of the gas withdrawal case for gas dependant industries.

The net (LNG plus gas dependant industry) cumulative discounted benefit indicator outcome is -$100 billion. The cost benefit ratio for gas withdrawal increases to 24.2 to 1, which may be compared with the preliminary estimate of 21 to 1 calculated in Section 4.1.3 above. Far from reducing the burden, placing the two cases in the broader context of the national economy increases the net cost of shifting gas from gas-dependent industries compared to LNG export expansion.

4.6 Conclusion

When natural gas is reallocated to exports from domestic use in gas-dependent industries, for every $1 of benefit gained from exports $24 of benefits is lost in contraction of the gas-dependent industries. This can be stated in discounted terms. In 2009 140 PJ of natural gas was allocated to Australian gas-dependent industries. It would have taken 3,400 PJ of LNG exports to deliver this benefit. If, at full development, the Australian east coast LNG industry is supplied at the expense of domestic gas-dependent industry, it will deliver less than a third of the benefit required to offset the loss of domestic industry.

On the other hand, the domestic gas using industrial sector does not put a significant claim on the supply options for Australian LNG and thus the growth options for LNG are not significantly constrained by domestic needs at present. However, this will change if large demands are made on gas as a transitional fuel to renewables.

The core issue is whether the large scale export of gas will constrain the ability of the domestic industry to expand or even maintain existing production levels. This will be considered in Chapter 6. In Chapter 5 we generalise the calculations of the present chapter.

5. The net benefits: LNG exports versus domestic gas use – the case of the general economy

One way to assess the impact of switching natural gas from domestic to export sales on the general economy, that is the non-resource sector of the economy, would be to use a large scale multi-sector model of the economy with detailed industry energy demand equations. Energy prices in general and natural gas prices in particular could then be adjusted until domestic natural gas use was reduced to required levels and the impact on the macroeconomic indicators assessed.

NIEIR has such a model and has used it for similar exercises many times. However, the model results are highly sensitive to model closure conditions. The final outcomes depend on which sector bears the cost adjustment for whatever the changed energy capacity arrangements have to be put in place to maintain overall demand/supply balance. From experience, the quantitative impact of the optimum strategy is approximated by a simple approach, which is adopted here.

The approach requires the direct estimation of a production function for the non-resource economy with capital, labour, gas and electricity as factor inputs. The estimated production function coefficients are then used to calculate the elasticity of substitution between gas and electricity. These two fuels are sufficient to specify the production function since, after the adjustment from the oil price shocks of the 1970s and early 1980s, the substitutability between natural gas and oil has been reduced to low levels. Effectively, gas now mainly competes with electricity.

A quantitative estimate of the elasticity of substitution between gas and electricity will enable the calculation of the quantity of electricity that must be supplied to leave economic activity unchanged after the withdrawal of domestic gas.

However, the economic adjustment does not end there. If the additional electricity supply can only be secured at significant additional cost, the additional costs on the economy will have to be taken into account. If these costs are allowed to flow into the industry structure of the economy there will be a whole range of flow-on effects, including loss of exports, increased imports and reduced real incomes. The least cost option (in terms of the fall in economic activity) is to channel the costs into the household sector with the major burden of adjustment being via real household incomes rather than by reduction in investment, exports, employment, and so on.

An alternative strategy would assume that there is no attempt to compensate for the loss of gas supply and non-resource gross product falls in line with the production function coefficient implications. This channel will also be evaluated in this chapter.

There is a third possible approach. This involves suppressing natural gas supply into the electricity sector which would force electricity production to exploit alternative and higher cost sources of supply. This lies outside the production function approach since natural gas input into electricity is included in the electricity input into the general economy.

These three alternative approaches are evaluated in turn.

5.1 The Australian production function

The task is to estimate a production function to determine directly the role of gas and electricity in driving Australia's economic activity. By definition it takes a supply side approach to economic activity.

A general production function can be written in the form:

$$Y = ae^{rt}(K, L, E, G) \quad (5.1)$$

Where:

Y = output, which may be defined as gross product of the economy, gross product of the private sector, or gross product of a combination of industries.

L = labour employed.

t = transport or total general government capital stock.

r = rate of exogenous technological change.

If a Cobb-Douglas production function is specified, then (4.1) becomes:

$$\ln Y = \ln a + rt + \alpha_1 \ln K + \alpha_2 \ln L + \alpha_3 \ln TE + \alpha_4 \ln G \quad (5.2)$$

where ln denotes natural logarithms.

The key estimate is for the a coefficient, or the elasticity of output with respect to gas input.

However, the Cobb-Douglas production function is restrictive in terms of the implied returns to scale for individual factors and the elasticity of substitution between factors. The latter is important for this study because of the requirement to use the elasticity of substitution between gas and electricity to obtain estimates of the costs of gas demand suppression.

To circumvent this, a flexible, that is, unrestricted, transcendental production function is estimated. This takes the form:

$$Y = Ae^{rt} \ln^{\alpha 1} e^{b,L} . K^{\alpha 2} e^{b2K} . E^{\alpha 3} e^{b3E} . G^{\alpha 4} e^{b4G} \quad (5.3)$$

The two estimated coefficients which are of particular interest to this study are α_4 and b^4.

5.1.1 The data

Pooled time series cross section data are used to estimate the coefficients. The data is for the five mainland states. The period of estimation is from 1980 to 2011.

The output variable is state gross non-resource product (total state gross product at factor cost less gross product of agriculture and mining and ownership of dwellings. The annual data over recent years is from the Australian Bureau of Statistics (ABS) "*Australian National Accounts*", Cat. no. 5202.0. These estimates are spliced back to 1980 using estimates by NIEIR.

The labour input variable is total hours of work of the non-resource sector by state obtained from ABS "*Labour Force Australia*", Cat. no. 6203.0.

The methodology of estimating capital stock input by state for business capital stock and transport infrastructure capital stock is outlined in NIEIR's "*Transport Infrastructure Investment: An Instrument for Sustainable Debt Financed Fiscal Policy*", April 2012.

The energy data is taken from the Bureau of Resources and Energy "*Economics – data base for energy consumption by state and industry*". The electricity sector energy input is excluded from the non-resource sector totals for electricity and natural gas.

To remove cyclical effects a five year moving average is passed through the data.

5.1.2 The production function: Coefficient estimates and implications

The estimated coefficients are given in Table 5.1. Ignoring the constraints, non-zero coefficients are of the correct sign and, bar one, strongly significant.

A sensitivity analysis was used to calculate the elasticity of substitution between gas and electricity input and the elasticity of non-resource gross product for the four Eastern Australian mainland states. The elasticity of substitution, as at 2011, was calculated as -0.67. This means that if one PJ of natural gas is withdrawn from Eastern Australian markets, it will require an increase in supply of 0.67 PJ of electricity to maintain a constant level of non-resource gross product.

The elasticity of non-resource gross product at factor cost, with respect to natural gas input for the four Eastern Australian mainland states, was found to be 0.082.

Table 5.1 Estimated coefficients of the transcendental production function

Parameters	Coefficient	t-value
α_1	0.455	9.9
b_1	0.00000015	1.4
α_2	0.483	10.6
b_2	-0.0000067	10.1
α_3	0.011	0.6
b_3	0.103	3.2
α_4	0.0	–
b_4	0.00088	7.6
NSW constant	-0.428	0.8
VIC constant	-0.609	1.1
QLD constant	-0.653	1.2
SA constant	-0.615	1.2
WA constant	-0.803	1.6
$R^2 = 0.985$		

5.2 General economy adjustment to domestic suppression of 50 PJ of natural gas – the electricity substitution case

The three self-contained cases for the adjustment of the general economy to the suppression of 50 PJ of natural gas will be examined in terms of their impact on the economy using the framework applied in the previous chapter.

The elasticity of substitution between natural gas and electricity estimated above suggests that if 50 PJ of natural gas are withdrawn from the domestic market, 34 PJ of electricity will be required to maintain production capacity. The substitution would be partially focussed on space and water heating and process heat involving drying and melting.

Table 5.2 indicates that a considerable cost differential currently exists between electricity and gas, depending on the market and the carbon price. This means that total direct costs of adjustment will depend on the carbon price and a scenario analysis is therefore needed. This will be undertaken in Chapter 7 below. To illustrate the impact on the economy, in terms of the analysis of the previous section, a $50 price of carbon will be assumed. The data in Table 5.2 includes all transmission and distribution costs. The analysis here is for ex-plant costs.

Table 5.2 Current electricity and gas prices in Australia: The impact of carbon prices

	Electricity price	Gas price
No carbon pricing		
Industrial	$100/MWh = $28/GJ	$10/GJ
Residential/commercial	$250/MWh = $69/GJ	$16/GJ
Carbon pricing – $25/t CO_2e		
Industrial	$125/MWh = $35/GJ	$11.8/GJ
Residential/commercial	$275/MWh = $76/GJ	$17.8/GJ
Carbon pricing – $50/t CO_2e		
Industrial	$145/MWh = $40/GJ	$13.3/GJ
Residential/commercial	$295/MWh = $82/GJ	$19.3/GJ

5.2.1 The net cost of electricity substitution

It is critical that the same model framework be used for all evolutions of the possible adjustment paths for gas suppression. The framework developed in the previous section is ideal in terms of transparency and assessing the plausible impact of the contraction in gas dependent industries. For the more general adjustment paths of this chapter, other evaluation approaches are possible, but these would result in unacceptably different methodologies for quantifying impacts. Accordingly, the methodology used for calculating impacts in the electricity substitution case has been designed so that the modelling framework of the previous chapter can be employed. This framework also allows the straightforward introduction of probability analysis. The result is that the shock which is imposed on the model structure becomes a direct adjustment to real household disposable income.

It should be noted that no allowance has been made for the impact on distribution margins. It is assumed that the same total margins have to be recouped to support the distribution infrastructure installed, irrespective of throughput. In any case, the reduction in gas distribution margin would be offset to some extent by the increase in electricity margins.

These preliminaries out of the way, we proceed to model the full electricity substitution case. In the absence of the East Coast LNG plants, the industrial gas price will be taken to be $6/GJ. For each $10 of carbon price the cost of natural gas increases by $0.72/GJ, so the alternative gas price is $9.6/GJ. Therefore, the forgone cost of natural gas will be 9.6 x 50, or $480 million in 2009 prices.

Assuming that between 2012 and the 2020s there is increasing public and international anxiety about the baleful consequences if CO_2 emissions are not curbed, and therefore increasing political and economic pressure to reduce CO_2 emissions, the alternative electricity substitution cost will be taken to be an average of renewable options, for which recent cost estimates range from wind at $110 MWh to solar at over $200 MWh, with other renewables such as geothermal between the two polar cases. The average will be set at $150 MWh. This translates into $42 million additional cost per PJ, or $1.43 billion for the 34 PJ of electricity required.

The net cost is, therefore, 1.43 – 0.48 = $0.95 billion in 2009 prices annually.

To minimise the loss of employment and economic activity, the optimum cost allocation strategy would be to channel the impact into additional cost imposts on the household sector. This would hypothetically be done by:

(i) increasing direct taxes on households to pay for subsidies to shelter industry from the additional energy costs;

(ii) increasing residential electricity prices more than prices for non-household users; and

(iii) increasing the costs of electricity for those commercial sectors that service the household and Government sectors rather than trade-exposed industries.

The results of doing this for the full electricity substitution case are given in Table A.4 to Table A.6.

For the gross product indicators the impact is positive being about two thirds of the LNG overall impact. The combined total impact is a strong $1199m at factor cost. For net national product the increase is much less because of the high depreciation rate for the electricity sector. More importantly private consumption expenditure falls by $810m, or a net $646m if the LNG impact is included. The benefit indicator falls by $423m, more than cancelling out the gain from LNG exports. Full electricity substitution therefore results in no net benefit from LNG exports. The strong response for gross product is due to the fact that the drivers of this growth are dominated by factors (foreign income and depreciation allowances) which cannot be used to support domestic consumption and tax growth.

5.3 General economy adjustment to domestic suppression of 50 PJ of natural gas: The decline in economic activity case

Rather than release gas for export by switching to electricity, it would be possible to release the gas by reducing industrial activity. It is implausible to assume that all the natural gas suppression will involve reductions to industry; part will come from reductions in allocation to households. In the case here it is assumed to be 30 per cent of the total reduction impacts directly on households at a cost similar to the electricity substitution.

This still leaves 35 PJ to be suppressed from the non-resource industries. For the Eastern Australian market this will represent a 7.6 per cent reduction in supply. Using the elasticity estimated above, this will generate a 0.6 per cent reduction in gross non-resource product which translates into a $4.68 billion reduction in non-resource gross product at factor cost for the four Eastern Australian states. Using the relationship between direct reductions in household income and gross product at factor cost (see the model sensitivity results in the previous section) this indicates a direct reduction in household income of $3.58 billion. To this has to be added the reduction in real household incomes due to the transfer of 15 PJ of natural gas from the household sector to exports and its replacement with electricity. Using the full substitution case as the benchmark this will add $0.3 billion, bringing the total to $3.9 billion in 2009 prices.

Table A.4 shows the impact on the general economy for the general reduction in economic activity case. In terms of gross and net product, the decline in activity is six times the LNG benefit. The benefit indicator declines by 17 times the LNG benefit. Even if we make no particular allowance for gas-dependent industries and instead base the calculations on the non-resource sector as a whole, the outcome is decidedly unattractive.

5.4 General economy adjustment to suppression of 50 PJ of natural gas: The electricity sector gas substitution case

We now consider the case where gas is switched from the electricity sector to LNG exports. In this case, before the need for gas suppression, the 50 PJ of gas would have been used in the electricity sector to generate electricity. The scenario is that, in the absence of East Coast LNG exports, large scale gas-fired electricity plants would have been built near major CSM deposits and these exports require that the electricity sector will have to substitute other sources of electricity generation.

The two key determinants of the cost of this response are the cost of electricity generated from natural gas and the cost of the alternatives.

The cost of natural gas derived electricity will be a function of the natural gas price and the carbon price. Table 5.3 indicates a range of responses depending on the gas price and the carbon price. Assessing the effect of the carbon price involves modelling probabilities, because of the range of possibilities both for a given year and across time. This is carried out in Chapter 6 below. To illustrate the impact on the economy that is comparable to the approach taken for other adjustment paths above specific assumptions have to be made. The assumptions are:

- a price per gigajoule of $4; and
- a carbon price of $50.

From Table 5.3 this indicates an electricity price of $78 MWh.

As before, the alternative electricity price will be renewables at an average rate of $150 MWh. To complete the cost estimates it is necessary to know how much electricity can be generated from 1 PJ of natural gas. 1 PJ of electricity is 278 GWh. If a conversion factor of 0.45 is assumed, then 1 PJ of natural gas will generate 125 GWh of electricity. Hence, 50 PJ will generate 6,250 GWh or $489 million. If the alternative 6,250 GWh comes from renewables, then the cost will be 6.25 x 150, or $938 million, giving a net cost of $457 million.

Table 5.3 Natural gas based electricity – cost of supply by input costs

Combinations	Natural gas price ($/GJ)	Carbon price ($/tonne of CO_2)	Long-run marginal cost CCGT ($/MWh)
1	3	0	49
2	4	0	55
3	5	0	61
4	6	0	67
5	3	50	69
6	4	70	83
7	5	80	93
8	6	100	107
Alternative			**150**

Note: CCGT denotes combined cycle gas turbine. Assume 65 per cent capacity factor. For every $10 increase – carbon price a $/tonne of CO_2, the price will increase by $4/MWh. For every $1/GJ increase in the natural gas input price the $/MWh price increases by approximately $6 in 2009 prices.

The impact on the general economy of the gas suppression case is given in Table A.4. This is a low cost case compared to the decline in economic activity case but comes at a higher cost than the full electricity substitution case. For the gross product indicators, the decline is a little under 40 percent of the LNG benefit. However, there is a deterioration compared to the net product indicator with the loss from the gas suppression case almost cancelling out the gain from the LNG expansion. However for the benefit indicator the loss from gas suppression in electricity use is nearly 30 percent more than the LNG benefit.

It should also be noted that the suppression of gas supply to the electricity sector, or if suppression is avoided the increase in gas prices that will result from LNG netback pricing and production from higher-cost reserves, would ultimately have implications for the costs of all existing gas-fired generators. Operating costs for both peaking plants and CCGT would increase, driving higher spot and contract prices in the National Electricity Market.

The electricity sector gas suppression case is a relatively low cost option. Nevertheless the net costs are still significant.

5.5 Conclusion

Analysis which abstracts from the position of the gas-dependent industries concludes that natural gas can be switched from domestic sales to LNG export sales using a number of strategies, the best of which yields little benefit to the economy and the worst substantial net costs. In this worst case, the costs approach those calculated when concentrating on the position of the gas dependant industries. To minimise cost, the following factors would have to be put in place, namely:

(i) the natural gas dependent industries were quarantined from any impact of LNG expansion on available gas supplies and costs;

(ii) the electricity sector would have to plan to carry the full cost of adjustment including higher quantitative targets for renewable energy; and

(iii) the household sector would have to accept that it and not industry would have to directly accept the full costs of adjustment.

Historical experience, the current design of the policy for the introduction of carbon taxes and the political debate over carbon pricing give no grounds for businesses to expect that the minimum cost path would be adopted if it becomes necessary to withdraw domestic natural gas supply to meet export contracts.

How the four options may be combined to determine an overall gas suppression response is outlined in Chapter 7 below.

6. The Australian gas market: Resources, prices and risk of supply shortage by 2040

The prime objective of this chapter is to assess the risks of supply shortages in the Eastern Australian gas market by 2040. This is a critical final step to assessing the likelihood that the costs of natural gas supply withdrawal assessed in the previous two chapters will be realised. The risk of gas supply shortages emerging in turn depends on estimates of natural gas reserves remaining to be discovered.

6.1 The Australian natural gas market: Background

The Australian natural gas industry has three distinct components:

1. the domestic Eastern Australian system;
2. the domestic west/north coast systems; and
3. the LNG export industry (currently only on the west coast fed mainly from off-shore fields, with plants proposed for Eastern Australia based on coal seam methane).

As with electricity, there is no transmission connection between the east and west coasts (Tasmania is connected to the eastern gas and electricity transmission systems).

In 2012-13 total Australian gas production will be about 2,500 PJ, about 35 per cent of which will be exported as LNG. The main producing basins are: in the East, the Gippsland, Cooper-Eromanga and Otway (conventional); and the Bowen and Surat (coal seam gas); and in the West, the Carnarvon, Bonaparte and Browse.

In the domestic markets, east coast demands are about 800 PJs and west/north coast demands 650 PJs. The major domestic markets are for gas-powered electricity generation (GPG), industrial and residential consumption. The GPG market is growing most rapidly but future GPG increases depend significantly on carbon pricing policies.

The current CO_2e price of \$23/t CO_2e is not high enough to stimulate substantial growth in GPG for combined cycle gas turbine (CCGT) base load plants. Gas peaking plants are relatively unaffected by carbon pricing, being mainly responsive to growing summer peak loads where gas plants (open cycle gas turbines, OCGTs) have distinct quick response advantages. Growth in GPG base load will depend on carbon tax levels, gas prices, coal prices and any policy initiatives that directly favour gas (such as the Queensland gas generation policy).

In the industrial sector gas is used for process heat (drying, etc. such as alumina production), water heating, steam raising and for production of petrochemicals (such as ammonia). Metal products, petroleum and chemicals and non-metallic mineral products account for about 85 per cent of industrial gas consumption in Australia.

The alumina industry, a major use of gas for drying (often with cogeneration), is concentrated in south-west Western Australia (Kwinana region) and Gladstone in Queensland. In Western Australia, industrial gas prices have increased substantially (from \$4/GJ to \$8/GJ) due to domestic market supply/demand constraints and reliance (65 per cent) on the North West Shelf project (LNG predominantly) supply. In eastern Australia industrial gas prices are in the \$4 to \$6/GJ range, including network costs as well as wholesale gas costs. At higher prices (>\$10/GJ) some industrial gas users could lose competitiveness to competitors based

in gas rich regions, such as the Middle East. Fertiliser and other chemical plants would be at risk, as would alumina.

Over 2011-25 NIEIR estimates (July 2012) growth in industrial gas use will average 2.91 per cent per year, residential 1.48 per cent, commercial 2.4 per cent and electricity generation 4.48 per cent per annum.

The major industrial market is in Western Australia (alumina, direct reduced iron and ammonium nitrate), 55 per cent of national industrial market. The major residential market is in Victoria (space and water heating), 65 per cent of national residential market. GPG is strongest in Queensland and Western Australia.

6.2 Estimates of reserves

Category 1 reserves (commonly referred to as 'Proven' or 'P1' reserves) include recoverable reserves that have been declared commercially viable. **Category 2** reserves (commonly referred to as "Probable' or 'P2' reserves) comprise estimates of recoverable reserves that have not yet been declared commercially viable, although they have been geologically proved or are awaiting further appraisal. Geoscience Australia (GSA) are now **mainly** using the McKelvey classification of economic and sub-economic demonstrated resources (EDR, SDR), but do not precisely define (for example, $/G) EDR and SDR. In addition, P3 possible/potential reserve estimates are sometimes estimated. Also, inferred resources are mentioned. These arise from recent discoveries and finds that require further appraisal.

While there is always some uncertainty associated with any reserves estimates, GSA's estimates are often regarded as conservative. These estimates should perhaps be seen as a lower bound estimate of actual reserves. Due to this conservatism, NIEIR formulates its own estimates of reserve levels in the eastern basins by supplementing official data with information recently published by operators and other basin participants. Over the years (1980s on) we have observed significant increases in GSA reserves towards NIEIR estimates.

West Coast (Western Australia/Northern Territory) reserves are mainly in off-shore basins (Carnarvon, Browse, Bonaparte) and amount to about (2009 data, no recent update) 165,000 PJ in P1 and P2 reserves (not including CSM or shale gas). Source: Geoscience Australia, Oil and Gas Resources of Australia 2008.

Eastern Australian reserves, from the same source, P1 and P2 reserves were about 11,000 PJ (excluding CSM and shale reserves); and P3 at 28,000 PJ. CSM reserves (P1, P2) were estimated at 37,000 PJ (P3 at 60,000 PJ).

McKelvey classification reserve estimates are outlined below. Source: Australian Gas Resource Assessment, 2012.

Table 6.1 Australian conventional gas resource represented as McKelvey classification estimates as of 1 January 2011

Conventional gas resources	PJ	tcf
Economic demonstrated resources	113,400	111
Sub-economic demonstrated resources	59,600	53
Inferred resources	11,000	20
Total	**184,000**	**184**

Table 6.2 McKelvey classification estimates by basin as at 1 January 2011			
		Gas	
McKelvey class.	**Basin**	**PJ**	**tcf**
EDR	Carnarvon	74,700	68
EDR	Browse	17,900	16
EDR	Bonaparte	10,100	9
EDR	Gippsland	7,000	6
EDR	Other	3,600	0
Total EDR		**113,400**	**103**
SDR	Carnarvon	26,800	24
SDR	Browse	17,900	16
SDR	Bonaparte	11,900	11
SDR	Gippsland	2,300	2
SDR	Other	1,200	1
Total SDR		**59,600**	**54**
Total (EDR + SDR)		**173,000**	**157**

CSM/G reserve estimates, not included above are presented below.

Table 6.3 CSG resources at January 2011		
CSG resources	**PJ**	**tcf**
Economic demonstrated resources	35,905	33
Sub-economic demonstrated resources	65,529	60
Inferred resources	122,020	111
Total	**223,454**	**203**

Table 6.4 Total Australian gas resources

Resource category	Conventional gas		Coal seam gas		Tight gas		Shale gas		Total gas	
	PJ	**tcf**	**PJ**	**tcf**	**PJ**	**tcf**	**PJ**	**tcf**	**PJ**	**tcf**
EDR	113,400	103	35,905	33	–	–	–	–	149,305	136
SDR	59,600	54	65,529	60	–	–	2,200	2	127,329	116
Inferred	11,000	10	122,020	111	22,052	20	–	–	155,072	141
All identified resources	**184,000**	**167**	**223,454**	**203**	**22,052**	**20**	**2,200**	**2**	**431,706**	**392**
Potential in ground resource	Unknown	Unknown	258,888	235	Unknown	Unknown	435,600	396	694,488	631
Resources – identified, potential and undiscovered	184,000	167	258,888	235	22,052	20	435,600	396	900,540	819

Note: Conventional gas demonstrated resources as of January 2011; CSG demonstrated resources as of January 2012. Note CSG 2P reserves and 2C resources are used as proxies for EDR and SDR respectively.

Tight gas and shale gas resources

Currently Australia has no proven reserves of tight or shale gas. The in-place resources of tight gas are estimated at around 22,000 PJ (20 tcf) but together with shale gas could be considerably higher. The largest known resources of tight and shale gas are in low permeability sandstone reservoirs in the Perth, Canning, Cooper and Gippsland basins with APPEA's estimates at 440,000 PJ of total possible reserves

6.3 Total Australian reserves (identified, potential and undiscovered)

What is important for this study is not total Australian reserves, but reserves that can supply the integrated Eastern Australian market. This is the market that the East Coast LNG projects will impact. The situation would be different if the Western Australian market was integrated with the Eastern Australian market.

6.3.1 Two estimates of Eastern Australian case reserves

One recent attempt to estimate Eastern Australian reserves was carried out by **Core Energy Group** (COE): gas (Eastern Australian) resource studies, 2012. This study included a section on the distribution of gas reserves by gas production costs (COE page 24).

Core estimated a total of 143,066 PJs potential resource at 1 January 2012 at up to $6/GJ and about 161,000 PJs at up to $8/GJ.

In the report (Table 7.1) **conventional** resources were estimated to be 13,000 PJ at up to $7.37/GJ at a 10 per cent rate of return. In Table 7.2, **coal seam gas** reserves were estimated to be 96,000 PJ at up to $5.58/GJ at a 10 per cent return. In Table 7.3 estimates for total Eastern Australian **prospective** resources were given as 190,000 PJ at up to $9.27/GJ at a 10 per cent return.

The study also gave estimates of gas transmission costs as at April 2012. Indicative tariffs for **existing** pipelines are provided in this report in Table 6.4, page 12.

For **new** pipelines estimated tariffs are presented in **Figure 10.4** for a range of pipelines. For example, an estimated tariff of $0.0018/GJ/km for a 1,000 kilometre hypothetical pipeline would result in a tariff of $1.8/GJ for the full 1,000 kilometres of gas transmission. Estimated tariffs are also presented in **Figure 10.4** for a range of existing pipelines such as $0.0014/GJ/km for the Eastern Gas Pipeline. Tariff components (WACC, taxation, etc.) are also provided for several pipelines.

Another study which also estimates remaining gas reserves was by **ACIL Tasman**: draft report, December 2011, Fuel cost projections. This report was prepared for Worley Parsons to provide natural gas and coal outlooks for AEMO modelling.

ACIL Tasman estimated (page 6, Figure 3) that around 90,000 PJ of potential (reserves and resource) could be developed on the East Australian seaboard at up to A$8/GJ (of which 50,000 PJ is Queensland CSM); and 60,000 PJ (about 40,000 PJ of CSM) at up to $6/GJ. **Note** that in the same report ACIL Tasman estimated that in addition to these reserve estimates 25,000 PJ of Eastern Australian shale gas could be available at $9/GJ.

These estimates are much lower than the COE estimates outlined above. The reasons for estimate differences are difficult to discern from the two sets of reports, though COE allows for sales of liquids from gas projects, thus improving project economics.

Potential use of Eastern Australian reserves over 2012-2040 are presented below.

Table 6.5 Potential domestic use of Eastern Australian natural gas reserves

		2015 (NIEIR)	2025 (NIEIR)
Gas (2011, 1,300 PJ)	**Total**	1,400 PJ	2,300 PJ
	GPG use	416 PJ	986 PJ
	Excluding gas for power generation (GPG)	≈ 950 PJ	≈ 1,300 PJ
Electricity consumption	Total in NEM	200,000 GWhs	256,000 GWhs
	Australia	236,000 GWhs	311,000 GWhs

Potential GPG (electricity) use

A 400 MW CCGT	at 90 per cent capacity factor requires about	22 PJ/a
A 10,000 MW CCGT	at 90 per cent capacity factor requires about	550 PJ/a

Potential LNG export use

LNG	4 Mt plant requires	200 PJ/a	1 train
	20 Mt plant requires	1,000 PJ/a	5 trains

28 years (2012-2040) potential use

End use	Approximate average	1,700 PJ/a	= 47,600 PJ
10,000 MW GPG by 2040	Approximate average	300 PJ/a	= 8,400 PJ
LNG (6 trains by 2040)	Approximate average	800 PJ/a	= 22,400 PJ
			78,400 PJ

This suggests adequate availability at up to $8/GJ on the above assumptions: LNG use could be higher but GPG and end-use could be lower. Table 6.5 is the basis for the Eastern Australian market's natural gas projections for the case of no LNG plants outlined below.

6.3.2 Western Australia/Northern Territory

Domestic gas use

In 2012 Western Australia's total gas use is estimated at 617 PJ and Northern Territory at 43 PJ. Western Australia's gas use is dominated by industrial use (442 PJ) and GPG (145 PJ), growing respectively over 2012-25 at 2.65 per cent and 3.44 per cent average per year. Total use in 2025 is estimated to be 905 PJ, the increase mainly through alumina, direct reduced iron, ammonium nitrate and GPG expansion.

In the Northern Territory industrial (24 PJ) and GPG (19 PJ) dominate gas use, growing respectively over 2011-25 at an average per year of 8.4 and 7.0 per cent. Total use in 2025 is projected to be 122 PJ through increases in industrial use (Gove Alumina conversion to gas from fuel oil) and GPG.

Potential domestic use over 2012-2040

At an average annual use in the region (Western Australia/Northern Territory) at the 2025 level of 1,027 PJ, regional gas use over 2012-40 would be about 30,000 PJ. Use could be higher depending on GPG economics (carbon and gas prices) and industrial use (regional competitiveness in global markets).

Potential LNG use over 2012-40

LNG use of gas in the region (Western Australia/Northern Territory) will depend on global demands for LNG and competitiveness of regional LNG plants.

Global LNG demand is projected to increase significantly over the period depending on global climate change policies: aggressive policies could constrain global gas demands. Regional LNG competitiveness could be constrained by high regional costs for new LNG plants and global LNG competition from the Middle East, East Africa, North America and Europe. The strength of this competition will depend considerably on the success of Middle East and Russian gas export strategies and on global shale gas developments. At regional (Western Australia/Northern Territory) average LNG exports over 2012-2040 of 100 Mtpa (about 5,000 PJ per year) LNG exports would total 140,000 PJ.

Total requirements, reserves and prices: Western Australia/Northern Territory

On the basis of the above estimates, 170,000 PJ of regional gas would be consumed (domestic, LNG) over 2012-40, about the current estimates (P1, P2/EDR, SDR) of regional reserves (excluding CSM and shale, which are not yet prominent in the region).

No costs of reserve estimates for the region are available as far as we are aware. Based on net back estimates required for existing and proposed LNG projects, we consider the requirements could be met at <A$8/GJ (ex-processing plant) and <A$10/GJ delivered to customers.

6.4 Proposed LNG plants, 2012-18

Over the period to 2018, 12 LNG plants are proposed: 8 on the west coast (output 70 mtpa) and 4 on the Eastern Australian (30 mtpa). If all proposed plants proceed, gas use by the plants over the period to 2040 would be about 3,400 PJ/a and about 84,000 PJ in total on the west coast; and 1,500 PJ/a and 36,000 PJ in total on the Eastern Australian. (ABARE/BREE, 2010; 5,930 PJ **total** exports in 2029-30.)

Given the prices of gas from LNG in export markets and the cost of liquefaction, transport, regasification and transmission to pricing hubs, to be profitable we judge LNG exporters must be able to access gas at $6-8/GJ (the net back price) for existing and proposed LNG plants.

6.5 Gas prices: weighted average, 2007-08 to 2039-40 – the current view

Gas prices have not been historically transparent whether at the well-head, ex-processing plant or delivered, particularly for large users.

Preliminary estimates for weighted average gas prices (ex-processing plant) are set out below.

Table 6.6 Projection of natural gas prices

Year	Prices (2011-12 $/GJ)	
2007-08	$4	
2011-12	$5	
	Conventional view	**Alternative (optimistic) view**
2019-20	$9	$7
2029-30	$13	$10
2039-40	$15	$11

The alternative optimistic view is based on potential global trends in gas supplies and demands (climate change policies and gas technology improvements for exploration and development).

Traded gas prices, for example those used by ACIL Tasman for the AEMO scenarios, continue to be mainly based on the oil price/gas export price relationship which could be loosened resulting in lower gas prices as global gas competition increases. That is, we believe that despite its continued use in gas trade pricing, there is no longer a logical basis for this concept. Gas and oil are no longer significant substitutes in energy markets for electricity generation, space and water heating, etc. Exploration, development and marketing of the two commodities have diverged over the past 20 years.

6.6 Shale gas: A global gas revolution

The production of gas from low permeability gas rich structures has led to a transformation of the USA gas industry. Gas production from this source in the USA has risen from 4 per cent of total USA gas production in 2004 to 25 per cent in 2011, a total in 2011 of 5,650 PJ (twice Australia's 2011 production) with a reserve estimate (USA EIA) of 4.8 x 10^6 PJs. The flood of shale gas has dropped wholesale gas prices in the USA from >US$10/GJ in 2006 to >US$3/GJ in 2011-12 and stimulated investment in USA LNG export plants.

There is potential for the North American (Canada also has shale gas reserves) experience with shale gas to be repeated elsewhere, but caution is advised as conditions (geologic, development costs, environmental, infrastructure, politics) for shale gas development can vary widely.

In Australia there appears to be significant shale gas potential in the Cooper, Galilee, Perth and Canning Basins.

In North America viable/profitable wellhead prices for shale gas appear to be >US$5/GJ, so the industry is currently not profitable leading to a write-down of shale gas assets by companies (including BHPB). Of the majors, Chevron appears to be shale gas positive with Exxon-Mobil less so.

In a report on Fuel Cost Projections to provide outlooks/inputs for AEMO modelling, ACIL-Tasman in December 2011 estimated an aggregate shale gas resource of 25,000 PJs in eastern Australia at a cost of around A$9/GJ (2012-13 $'s). The report noted that this would tend to limit upward pressures on gas prices. It should be noted, however, that this upper limit, if realised, would still be twice to three times as high as previous wholesale prices.

6.7 The specification of the probability distributions

The above analysis for Eastern Australia needs to be incorporated into the analysis by the specification of probability distributions for two key parameters, namely the remaining reserves and the percentage of remaining gas reserves discovered by 2040.

Table 6.7 gives Trigen probability estimates for the two parameters. The lower bound estimate is the ACIL Tasman estimate. The upper bound estimate is the Core Energy Growth estimate plus the tight and shale gas reserves estimate. There is considerable upside in terms of shale gas availability. This is incorporated into the analysis by setting the upper bound probability relatively low at 85 per cent. This ensures that the maximum upper bound will be higher than the estimate set in the table.

The specification of the estimates of the per cent of remaining reserves at 2011 discovered by 2040 is straightforward and given in Table 6.7.

The reserve production trigger ratio requires explanation. It is one of the most important parameters in the analysis. The central assumption is that there is a minimum identified reserve to production ratio which, if attained, will render prohibitive the risks of investing in gas-intensive projects. This applies equally to new projects as it does to the investment to maintain the competitiveness of existing facilities. This trigger's value will vary from project to project and industry to industry. It is unlikely to be much lower than 15. Below 15 means that the risks are high that there will not be enough gas to feed the gas-using capacity currently installed. For large scale gas-using projects, the realised reserves to production ratio would have to be significantly above 15 given a three year construction period and a 20 to 30 plant life. Hence, the upper boundary is set at a reserve to production ratio of 25 in Table 6.7.

Table 6.7 The specification of the Trigen probability distribution parameters

		Unit	Lower bound	Mode	Upper bound	Lower bound probability	Upper bound probability
1	Reserves remaining as at 2011	PJ	90,000	163,000	237,000	0	85
2	Per cent of reserves remaining as at 2011 discovered by 2040	Per cent	55	70	80	0	95
3	Reserves – production ratio trigger for suppressing gas demand	No.	15	20	25	0	100

In the model, if Eastern Australia's gas reserve to production ratio falls below the trigger level, the new growth in demand ceases and normal replacement investments are not made, meaning that underlying demand will fall by 2 per cent per annum. The level of demand falls to regain the benchmark reserve to production ratio. If more gas suppression is required gas is suppressed in the electricity sector and finally, in the case of severe restrictions, there will be plant closures.

6.8 The outcomes for the Trigen distribution

Probability estimates from the Trigen distribution parameters specified in Table 6.7 are presented in Table 6.8. The table indicates that the maximum estimate for discovered and undiscovered reserves, as at 2012, is 263,400 PJ. There is a 75 per cent probability that 147,000 PJ will be discovered and a 25 per cent probability that at least 200,000 PJs will be discovered.

The extraction ratio by 2040 of discovered reserves rises from a 5 percentile rate of 60 per cent through a mean of 70 per cent to a 95 percentile level of 80 per cent.

Table 6.8 Reserves and extraction probabilities		
	Ultimately recoverable reserves (PJs)	**Per cent of reserves discovered by 2040 (%)**
Aggregate indicators		
Minimum	91288.86	55.35
Maximum	263437.80	84.62
Mean	173481.80	69.89
Std Deviation	36426.91	6.06
Distribution		
5% Percentile	115200.30	59.67
10% Percentile	125942.10	61.64
15% Percentile	134066.20	63.15
20% Percentile	140810.00	64.43
25% Percentile	146886.90	65.53
30% Percentile	152278.00	66.55
35% Percentile	157293.80	67.46
40% Percentile	161965.70	68.33
45% Percentile	166397.90	69.14
50% Percentile	171161.40	69.90
55% Percentile	176066.50	70.66
60% Percentile	181323.10	71.46
65% Percentile	186829.00	72.32
70% Percentile	192840.70	73.23
75% Percentile	199367.60	74.23
80% Percentile	206442.70	75.32
85% Percentile	214675.40	76.58
90% Percentile	224387.30	78.05
95% Percentile	236890.60	79.99

6.9 The cost of natural gas ex-plant

A price constraint is also inserted into the model. If prices exceed a benchmark level new growth in demand (including replacement demand) will cease. The price formula in the model is given by:

$$Pg = 5 + 0.15 \,.\, RD$$

Where:

Pg = price of gas ex-processing plant.

RD = per cent of reserves extracted as a per cent of remaining reserves, as at 2012.

The schedule has an upper limit of $15/GJ as the extraction ratio of estimated 2012 remaining reserves approaches its upper limit.

6.10 The base case: No Eastern Australian LNG plants

Given the model developed above, the base case will be the case of no Eastern Australian LNG plants to 2040. This will indicate the risk of suppressed demand for gas in the absence of the LNG projects proceeding. The results are given in Table A.7.

If there were no East Coast LNG plants, there is no chance of suppressed demand by 2020.

In the absence of the LNG exports from Queensland, there is only a very small chance, at the 95 percentile level, of the need for gas suppression in the 2020s.

In the 2030s there is a mean risk of the need for natural gas suppression but it is small, at 25 PJ per annum. This is on the basis that between 2025 and 2040 the Eastern Australian domestic natural gas demand grows at 2 per cent per annum for non-electricity sector gas use. The electricity sector case stays constant at the 2025 level to 2040.

6.11 The case of LNG exports

The alternative case is of the impact of 24 million tonnes of East Coast LNG exports on the Eastern Australian demand-supply balance. For the 2012-2020 period there is a mean expected outcome that the Eastern Australian domestic demand will be suppressed by an average of 40 PJ a year. For the 2020s the mean expectation is for a suppression of 600 PJs, with the 25 to 75 per cent probability range being between 165 and 952 PJs. By the 2040s the expectation (that is, the mean) is that there will be a suppression of natural gas equal to 40 per cent of the unconstrained demand case. The 25 to 75 per cent probability range is for a 2040 natural gas suppression rate of between 24 and 58 per cent.

Overall the mean expectation is that a cumulative 15,000 PJs of natural gas demand will be suppressed.

Table A.9 gives the net impact of the East Coast LNG exports on the domestic demand supply balance. As the results in Table A.8 demonstrate, there is little difference between the results in the two tables.

The tables enable readers to apply their own judgement. If one wanted to be optimistic, then the 30 per cent percentile case could be made equal to the expected case. In this case there is still a cumulative shortfall by 2040 of suppressed domestic natural gas demand of 7,640 PJs, with severe supply shortages appearing in the 2020s and the expectation that by 2040 the suppressed demand as a per cent of base case demand is 27 per cent.

6.12 Conclusion

The results are very significant. The results indicate that either the national interest evaluation of the LNG plants was deficient or that confidential knowledge of the gas resources available confirmed that these resources are considerably greater than what is in the public domain. Even if the latter is the case, impacts will not be avoided. There may well be adequate reserves but businesses make decisions on what they know and what they know would indicate that gas is likely to be transferred from domestic to LNG export sales. In this case the net economic cost of the East Coast LNG plants having preferred access to supply will involve very large costs on the economy.

The exact costs will be quantified in the next chapter.

7. The net benefit of East Coast LNG expansion in the context of Eastern Australian demand/supply balance

This chapter takes the results of the last three chapters and assesses the net national benefits and costs of the East Coast LNG expansion. In the event of limited supply to domestic users, the burden of adjustment will be divided between:

- gas dependent industries;
- general economy adjustment – decline in activity;
- general economy adjustment – full electricity substitution; and
- electricity sector gas suppression.

The key task in preparing input to the analysis is to specify the distribution of the burden of adjustment.

7.1 Domestic industrial gas demand suppression in the allocation of the burden of adjustment

The allocation of the share each adjustment path will play is critical in driving the overall net benefits or costs. The reason for this, as Chapter 6 indicated, is that there is a wide range in the net costs of adjustment per channel with the highest being for gas dependent industries and the lowest for the full electricity substitution case.

One approach would simply be to assume the lowest cost outcome. The full electricity substitution case may be appropriate for an efficiently planned state like China which would incorporate the strategy into its five year planning guidelines and more often than not achieve the desired result. In Australia, the mechanism for adjustment is via price changes which, in this case, will have a negative impact on economic activity and real incomes, and increase inflationary pressures via loss of competitiveness.

The fact of the matter is that adopting the full electricity substitution strategy would require a large scale investment in the electricity sector where prices would need to rise to finance it. Given the current reaction to price movements driven by large investments in electricity distribution it would appear that further rises to substitute electricity for gas would be very difficult to achieve.

The second-best course of action, the suppression of gas usage in electricity production, would also be difficult to achieve as it would require increases in the share of renewable production. As the reliance on renewables increases, the stability of the electricity system will decline in that variations in climatic conditions (perhaps aggravated by climate change) will result in greater volatility in supply. The need to have gas fired generating capacity as a back-up supply source can only increase. The reality is that by the 2020s and certainly by the 2030s, there may well be severe constraints on the ability to suppress gas usage in electricity production.

While the costs of a choice to suppress supply to gas-dependent industries are extremely high, this scenario should not be ignored without study. The reality is that it is already happening. Major domestic natural gas users in Queensland (Rio Tinto and Incitec Pivot) are already forecasting natural gas shortages by 2015. This must affect their incentive to expand in Australia and even to maintain their Australian assets at a level that would prevent medium-term closure.

The only way to ensure that gas-dependent industries do not atrophy is to ensure that they have new and guaranteed supply sources for the next three to four decades at prices that can be projected with a degree of confidence. To guarantee supplies to gas-dependent industry will require substantial interventions in the existing regime. However, the need for intervention should be put in perspective: the gas-dependent industries' entire consumption (4 million tonnes a year) is less than the allocation of gas required to keep one LNG train supplied.

Because of the uncertainty surrounding the adjustment paths, a probability approach is adopted. Table 7.1 gives the Trigen probability distribution parameter settings. The burden of the adjustment of the gas-dependent industries is biased downwards compared to their share of overall gas demand. However, the setting of the upper bound probability at 0.85 allows for cases where the burden of adjustment may well be greater.

The resulting distribution of the adjustment share of gas-dependent industries is given in Table 7.2. The mean is a 10 per cent adjustment burden with the 25th percentile at 8 per cent and the 75th percentile at 12 per cent.

For the other channels of adjustment the means are:

- suppression of gas usage in electricity production – 22 per cent; and
- a general fall in economic activity – 16 per cent.

The remaining share would be borne by the residential sector and, at the mean, would be 100 less 22 less 16 less 10, or 52 per cent. This allocation imposes a conservative bias on the analysis, as the above discussion implies that the decline in economic activity should perhaps have a greater weight than it has been accorded.

Table 7.1 Trigen probability distribution parameters – domestic natural gas suppression of the adjustment burden by sector

		Maximum lower bound	Mode	Maximum upper bound	Lower bound probability	Upper bound probability
1	Gas dependent industries – share in gas suppression	0.05	0.09	0.13	0	0.85
2	Electricity gas usage – share in gas suppression	0.15	0.20	0.25	0	1.00
3	General economy – actual decline of electricity substitution – residual given the above three outcomes	0.08	0.15	0.25	0	1.00
4	Carbon price 2040 ($/tonne)	60	100	200	0	0.9
5	Alternative natural gas input price into electricity production ($/GJ)	3	4	5	0	0.9

Table 7.2 Reserves and extraction probabilities		
	Carbon price (2009 $/tonne)	Share of natural gas dependent industries in total gas suppression (%)
Aggregate indicators		
Minimum	15.18	5.35
Maximum	219.78	16.35
Mean	119.98	10.22
Std Deviation	44.41	2.42
Distribution		
5% Percentile	45.67	6.54
10% Percentile	59.50	7.13
15% Percentile	71.17	7.65
20% Percentile	79.88	8.05
25% Percentile	88.31	8.42
30% Percentile	95.00	8.74
35% Percentile	102.51	9.03
40% Percentile	108.53	9.33
45% Percentile	114.59	9.65
50% Percentile	119.88	9.96
55% Percentile	125.38	10.33
60% Percentile	131.42	10.65
65% Percentile	137.94	11.08
70% Percentile	144.24	11.48
75% Percentile	151.91	11.93
80% Percentile	159.74	12.39
85% Percentile	168.84	12.99
90% Percentile	179.75	13.66
95% Percentile	194.48	14.57

7.2 The distribution of CO_2 price outcomes

A probability approach was taken for the determination of the CO_2 price with the probability distribution parameters given in Table 7.1. The resulting distribution for the CO_2 price is also given in Table 7.1. The mean over the project period is $120 and the 25 to 75 per cent probability benchmarks are $88 to $152 a tonne.

The operating cost of natural gas for electricity in the absence of East Coast LNG also is determined by a probability distribution with the parameters given in Table 7.1.

7.3 The impact of East Coast LNG exports on the national economy: The expected outcome

Expected outcomes from the mean settings of the various inputs are determined by the probability distributions. This applies whether the input variable is carbon prices or estimates of natural gas reserves to be discovered. The expected results are given in Tables A.11 to A.13.

From Table A.8 there is some risk of gas shortages by 2020, though the risk is not large. What is significant is the inability to secure long-term contracts for gas at competitive rates as gas producers see the opportunity of LNG exports as a windfall, particularly since some LNG plants have yet to secure all their needs. This is the real driver of the crowding out of domestic supply which will have a very significant negative impact on downstream production, jobs and overall economic benefit.

The GDP increase at market prices is initially greater than the direct impact of the LNG exports. Employment increases by 82,000 compared to what would have otherwise been the case. From Table A.8, however, over the 2020s, the expectation is that domestic gas demand will be suppressed by 592 PJ on an average annual basis. This means that by 2020 the positive stimulus from the LNG exports is fully offset by the negative stimulus of the crowding out by gas suppression. All the production series are negative with the greatest decline being for NNP.

The decline continues but at a slower rate in the outcomes for the 2020-2025 period. By 2040 the decline is $22 billion for gross domestic product at market prices, while the net national product is $34 billion lower in 2040 compared to what otherwise would have been the case. The decline by 2040 is 775,000 in employment, while the benefit indicator declines by $46 billion, compared to the disallowance of East Coast LNG exports. This represents about 1.6 to 1.8 per cent below what national baseline GDP would be expected to be by 2040.

The employment loss may appear implausibly large. However, it is likely that the main response to a decline in employment will be via reduction in immigration. The employment loss over 30 years implies a net average annual reduction in immigration of some 35,000. The response to this may be that there is no national loss if the cost is borne by residents who will not be in Australia. The risk is, however, that the decline in employment may be so great that the required level of immigration will fall below the “bedrock” 170,000 to 200,000 level. In this case there will be increases in the effective unemployment rate. There is a limit to the size of a negative shock which can be imposed on the economy without considerable eventual economic pain.

The cumulative decline of the net benefit indicator is $160 billion. If the probability distribution for the expected reserves is near reality, the only strategy to minimise costs is to reduce LNG exports by the amount of the expected supply shortage. By 2040 the expected supply shortage equals the LNG requirement. This is, of course, when the plants are near the end of their expected life. The critical time is in the mid-2020s when the supply shortage is half the LNG demand.

In this context a prudent strategy would have been to perhaps approve one project and delay the approval of other projects until:

(i) the local industry was protected by identified reserves which are allocated to domestic use with a minimum headline reserve to production rate of 20 to 1 by 2040 given expected demand growth; and

(ii) identified available reserves support any new projects over there complete life.

7.4 The range of possible outcomes

Table A.10 shows the distribution of expected outcomes around the mean outcomes for 2020 and 2040. High negative outcomes would result if the ACIL Tasman estimates of remaining natural gas reserves are anywhere near the mark. The low negative and marginally positive outcomes would occur if the alternative estimates of reserves by COE are near the mark, at least in terms of reserves that can be extracted at $10/GJ.

The point about the results is that even if the reserves remaining are at the upper end of the range, the benefit of the East Coast LNG projects are marginal in that costs and benefits are in balance. This is clearly shown in Table A.10 where, if eventually recoverable reserves are near 240,000 PJ, the value of the net benefit indicator in 2040 is $2.4 billion.

7.5 Conclusion

The most important point of all is that even if ultimately recoverable reserves are in fact near the upper range currently assessed, or indeed in excess of the upper range, if these reserves are not identified and they cannot be quickly extracted to meet shortfalls at reasonable costs, the negative consequences in the table are likely to be realised. This is because:

(i) the natural gas dependent industries will not expand and would most likely go into decline;

(ii) gas using electricity plants will not be built; and

(iii) unnecessary costs will be imposed on the economy because businesses and Governments in the main will base demand on realised outcomes with an allowance for future supply security.

To illustrate the issue, assume that the ultimate recoverable reserves are 300,000 PJ. If gas producers continue their practice of allocating resources to export the reserves will not be identified and extracted for domestic use unless Governments force them to do so. The negative results of this analysis would remain, albeit reduced by the additional benefits of another LNG train or two. The only certain way to prevent the negative outcomes of this chapter is the identification and allocation of sufficient reserves for domestic use to cater for their needs for the next 30 to 40 years. In this context the estimates of overall remaining reserves are irrelevant. In any case, given the conservative allocation of weights in this study (that is, biased to low cost options), the benefits of additional potential reserves are likely to be neutralised by increasing the weight towards the higher cost adjustment options.

A related issue is the ownership structure of the enterprises which control the identification of reserves. If their interests are in “just-in-time” identification of reserves, a significant proportion of the negative consequences identified above will still be realised, even if the actual level of eventually recoverable reserves is much greater. Unfortunately, on the estimates presented here, future reserve estimates will affect domestic investment decisions even if they turn out to be too low.

Under the current reserves management practice and with the pipeline infrastructure limitations, Australia does not seem to have enough available reserves of gas to be able to avoid the negative effects of large increases in demand or of falls in the headline reserve/production ratio on business decision making.

8. East Coast LNG expansion: Additional downside risks

Three additional areas could add to the net cost over and above those identified in the previous chapters. These include:

(i) lower prices for LNG than expected;

(ii) higher alternative benefits from the use of the gas domestically; and

(iii) balance of payments adjustment costs to a rapid decline in the terms of trade.

8.1 East Coast LNG expansion: The impact of lower LNG prices

On the world stage, identified recoverable shale gas reserves, together with the extraction of the resource, are now growing strongly, particularly in the United States. United States reserves are large, estimated currently at 865 Tcf with relative low cost investment and production costs at around $4 to $6 per GJ. As a result, shale gas currently constitutes one quarter of United States total gas production and this is expected to increase to 50 per cent by 2035.

Once the United States authorities are satisfied that there is sufficient gas to satisfy domestic requirements for the foreseeable future, large scale LNG exports may be encouraged. Initially this will be done at low cost, converting LNG import infrastructure (currently unused because of the rapid expansion of shale gas production) to LNG export plants.

Given the analysis of the previous section, where the extraction costs are expected to rise to the $7 to $10 per GJ range because of resource depletion, the export of lower cost gas from the United States could force a $2 to $4 reduction in the export LNG price from the East Coast which would be a reduction of between 14 and 28 per cent. Even if LNG prices for East Coast Australia are linked, in part, to the price of oil, downward price pressure will not be avoided. The United States will not allow large scale export of gas until the gas has been fully utilised domestically to maximise the reduction in its dependence on oil imports. Other countries with substantial shale gas resources will also apply the same policies which, combined, will put significant downward pressure on oil prices and hence LNG prices.

If it is assumed that world-wide expansion of shale gas extraction reduces LNG prices by, in real terms, 20 per cent by the latter part of this decade, the effect of the decrease per PJ of output is:

- contribution to gross domestic product reduced by 25 per cent;
- tax receipts down by 66 per cent;
- domestic distributed income reduced by 28 per cent; and
- net national product reduced by 34 per cent.

These are average declines over the first 20 years of the project. The decline in tax revenue occurs because the collection of PRRT revenue is delayed until towards the end of the life of the project.

Table 8.1 shows the economy-wide impact given the above assumed price changes. The base case price is the 2011 level. The alternative case is a 20 per cent reduction in this level.

From the table, the reduction in net benefits is proportional to the reduction in the input parameters. The reduction in the net benefit indicator is $171 million for 50 PJ of exports, or a 43 per cent reduction to $229 million from the base case of $401 million.

This result provides the rule of thumb that:

- **for every 1 per cent reduction in the LNG price the economy-wide benefits from LNG exports will be reduced by approximately 2 percentage points. This stems mainly from the fact that tax receipts and domestic profits will be disproportionately impacted. Interest owed overseas will still have to be paid and debt repaid.**

Table 8.1 The impact of lower LNG prices

		Case study: 50 PJ of natural gas allocated to LNG exports – base case prices	Case study: 50 PJ of natural gas allocated to LNG exports – 20% reduction in base case prices	Net benefit of 50 PJ of LNG exports with 20% reduction in base case prices
Macroeconomic aggregates				
Gross domestic product at factor cost	$2009m	729.56	-186.22	543.34
Gross domestic product at market prices	$2009m	767.76	-198.23	569.53
Gross national product at market prices	$2009m	538.64	-187.21	351.43
Net national product at market prices	$2009m	355.40	-132.73	222.67
Total imports of goods and services	$2009m	75.85	-21.53	54.33
Total employment	**ths.**	**4.28**	**-1.25**	**3.03**
Household activity				
Wages and mixed income	$2009m	170.21	-48.13	122.08
Property income	$2009m	128.49	-54.30	74.20
Direct taxes paid	$2009m	67.21	-23.05	44.16
Household consumption	$2009m	184.68	-63.33	121.36
Government revenue				
Direct taxes on households	$2009m	67.21	-23.05	44.16
Direct taxes on business	$2009m	156.55	-112.19	44.36
Indirect taxes	$2009m	38.21	-12.01	26.19
Total tax revenue	$2009m	261.96	-147.24	114.72
Other indicators				
Income paid overseas	$2009m	229.12	-11.03	218.10
Benefit indicator	$2009m	401.02	-171.65	229.37

8.2 Foregone growth benefits from expansion of the chemicals sector

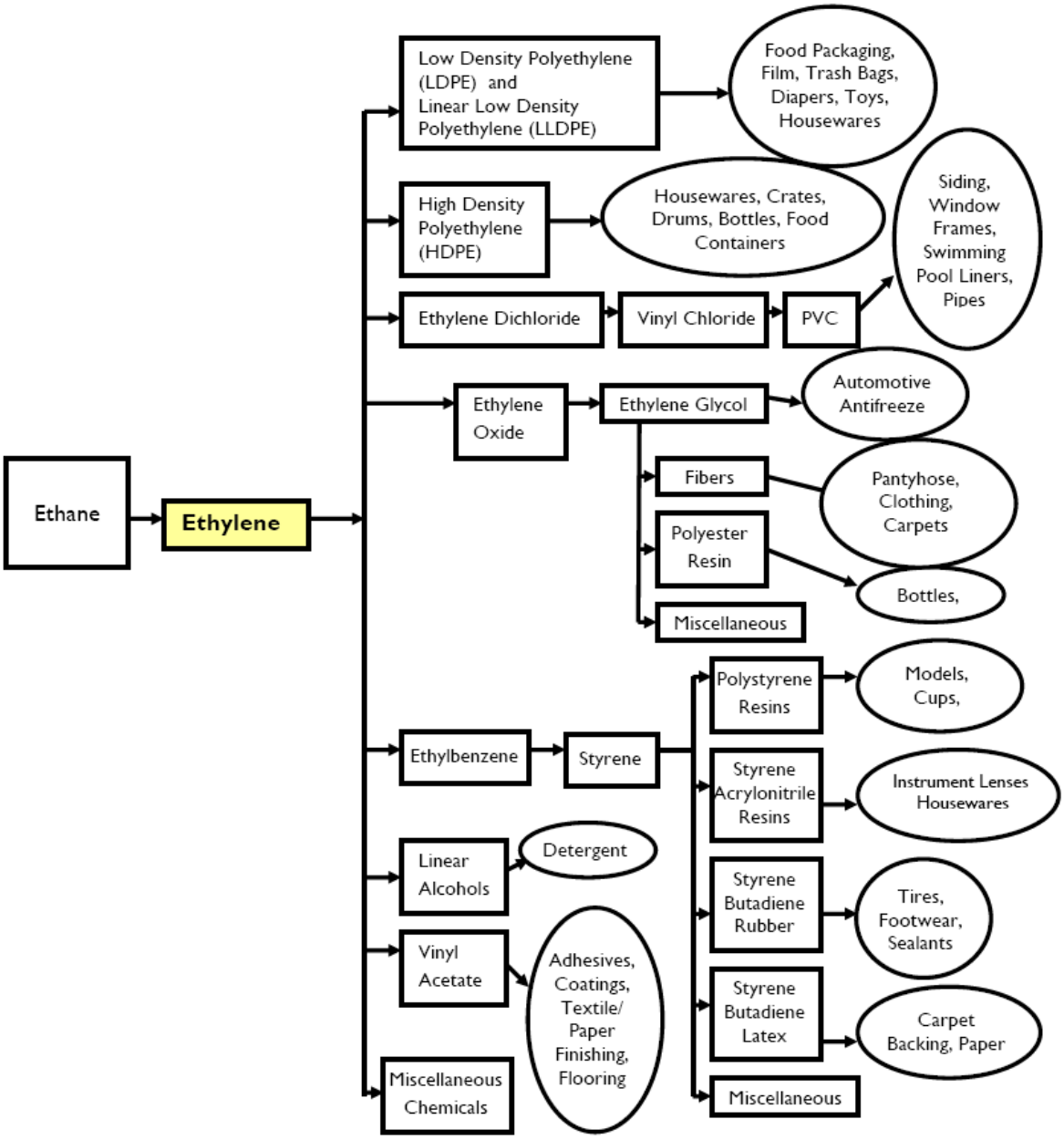
The analysis of Chapters 4 to 7 above were in the context of the existing chemicals sector being crowded out by natural gas shortages. This analysis provided minimum estimates which made no allowance for the foregone ability to grow the chemicals sector as a strategic industry – not only the gas-intensive chemicals industry (fertilizers, explosives) but also that part of the chemicals industry which uses natural gas liquids in general, and ethane in particular. Ethane is the next largest component of natural gas after methane. Its concentration varies from negligible levels to up to 6 per cent of a natural gas deposit. As Figure 8.1 shows, ethane is used to produce ethylene, which is an essential input into a wide range of chemical products.

A 2011 study by the American Chemistry Council (ACC) examined the benefits to the United States of an expansion in the chemicals industry enabled by expanded supply of natural gas. The American study had an indirect (that is inter-industry) effect of $US36 billion from a hypothetical but plausible 25 per cent increase in ethane supply. The ACC study used a completely unconstrained input output framework whereas for this study the chemical sector is treated as a constrained set of industries because of the methodology assuming it is constrained by gas supply. Therefore for this study it was necessary to estimate the indirect inter-industry effect on the rest of the chemical sector by the methodology outlined in developing the data in Table 4.2 which underlies the multiplier of 1.6 for the chemical sector as a whole. The induced multiplier for this study in the context of the Australian economy is of the order of 1.4. This represents the employment income, household consumption expenditure induced plus the non-chemical inter-industry effects which are identical to the Chemical Council study in methodology and concept. Thus if the Australian basic chemical value of $168 million per PJ is multiplied by 1.60 and 1.4 the result is $376 million per PJ which is less than the $415 million per PJ for the American study. The American total multiplier would be expected to be bigger because of the lower import content of the American economy and the greater complexity of the inter-industry supply chains.

Once this adjustment is taken into account the two studies are extremely similar in their quantitative conclusions.

If the investment effects are taken into account an interesting conclusion emerges. While the investment to output ratio for LNG is between 4.0 and 4.5 times the annual value of output, the equivalent ratio for the chemical sector is 0.5 because of the greater value extracted from the chemical sector use of natural gas. The value of output per PJ of natural gas used by the chemicals sector is 2.7 times that for the LNG sector. There is no validity in the argument that LNG should be promoted simply because of its investment intensity.

Figure 8.1: Ethane/Ethylene and the chemical industry flow chart



Source: American Chemistry Council, "*Shale Gas and New Petrochemicals Investment: Benefits for the Economy, Jobs and US Manufacturing*", March 2011.

8.3 The costs of adjustment when the mining boom ends

When the mining boom ends, the terms of trade will decline, the exchange rate will fall and the current account deficit will expand rapidly to double digit levels as a percentage of GDP. The current account deficit circa 2016 to 2020 at least will be around 5 to 6 per cent of GDP with terms of trade near current levels, and given Australia's existing high net international debt any fall in the terms of trade will increase the measured debt and require that the current account deficit be closed rapidly back to the 5 per cent of GDP mark.

Normally the exchange rate decline would be expected to carry some of the burden by facilitating an export expansion/import replacement response to cushion the impact on economic activity. However Australia is destroying capacity in its non-resource trade-exposed industries from a combination of natural gas suppression and the investment-discouraging effects of the loss of competitiveness due to the high exchange rate which has accompanied the boom in mining investment. (Admittedly the iron ore export industry bears major responsibility for the high exchange rate, but LNG exports have played a role.) The high prices for iron ore, coal and other mineral exports are bound to subside, if only because of current investment in expanding capacity in Australia, Africa and elsewhere, and when the high prices fall the Australian dollar exchange rate is likely to fall with them. At this point the loss of capacity in manufacturing, tourism and other trade-exposed industries will have two unpleasant consequences:

(i) the current account deficit will be considerably worse than what would have been the case; and

(ii) most of the adjustment required to bring the current account deficit back to sustainable levels will have to come from demand suppression via contractionary monetary and fiscal policies.

To illustrate, from Table A.11, the expected benefit from East Coast LNG exports would lead to a $6 billion increase in imports. At an average 20 per cent share of imports in GDP to neutralise the impact of the import increase of the balance of payments will require a loss in GDP of $30 billion. However, normal income elasticity effects will reduce this to around $15 billion. This is because imports are highly elastic with respect to GDP change. Even so, it is two to four times the expected GDP loss from Table A.11 from East Coast LNG exports in the 2020s.

Hence, the following rule of thumb.

- **For every $1m of lost GDP from the absence of effective policies to neutralise the impact of domestic gas suppression costs on the economy, at least an additional $2 million will be lost from the current damage being done to the Australian non-resource tradeable industries from the general effects of the currently high exchange rate and potentially from domestic gas suppression.**

This analysis has only been done in terms of the marginal case of Table A.11. The risks for the national economy in the period 2016-2020 appear to require careful analysis. The inference from the above calculations is that a sharp end to the mining boom and a return of the terms of trade to near pre 2005 levels would risk severe economic instability.

9. A review of current policy is urgent

It is not the task of this study to outline the appropriate policy regime. This study goes no further than demonstrating that, unless an appropriate policy regime is put in place, the cost of East Coast LNG exports from Australia is likely to be a net negative for the national economy.

In order to avoid the likelihood of net negative consequences to the economy, a policy review is urgent that considers the impacts and risks discussed in this report and develops policies which gave continuity to existing and potential large scale uses of natural gas in regard to:

(i) adequate supply availability over a 40 year horizon;

(ii) benchmarks for the determination of costs of supply; and

(iii) institutional arrangements which would ensure that domestic customers' long-term interests are protected.

In relation to (iii), the CME study, "*The Impact of Liquefied Natural Gas on Queensland Gas Markets and Gas Users*", March 2010, points to a number of factors which will contribute to negative outcomes from the East Coast LNG exports.

Firstly, as noted in Chapter 1, the interest of gas producers in LNG plants is giving foreign customers first preference in the supply of gas in part because sales on foreign markets are expected to be more profitable than sales to domestic customers. However, as the CME report notes, even if domestic gas sales had higher margins once the LNG plant came into production the domestic sales would become small compared to foreign sales. Higher margins on domestic sales will, therefore, make a small contribution to overall profits.

The drive to secure large scale supply for export markets has driven consolidation in the gas supply industry in Queensland and greatly reduced competition. Second, the control of gas producers over pipelines and, therefore, access is also contributing to a decline in competition. This discourages smaller scale producers from expanding or commencing production. The volume of gas going through pipelines to service export markets will make it easier for pipeline owners to apply for exemptions from pipeline access on the grounds of capacity constraints.

There will indeed be producers who will be willing to supply the local market. However, as the larger producers become increasingly export focussed, these producers are likely to be small scale and, therefore, inefficient and under-capitalised, which will not assist in increasing the confidence of local gas users in long-run prospects.

In this environment the required policy regime to optimise the national interest and to avoid the costs quantified in Chapter 7 is self-evident.

Appendix A: Tables related to chapters of this report

Table A.1	Natural gas dependent industries response to 50 PJ suppression of domestic natural gas demand – macroeconomic implications of different adjustment paths			
		Case study: 50 PJ of natural gas allocated to LNG exports	Case study: 50 PJ of natural gas withdrawn from natural gas dependent industries	Net benefit of reallocating 50 PJ of natural gas from natural gas dependent industries to export
Macroeconomic aggregates				
Gross domestic product at factor cost	$2009m	729.56	-11004.69	-10275.13
Gross domestic product at market Prices	$2009m	767.76	-12289.23	-11521.46
Gross national product at market prices	$2009m	538.64	-10994.01	-10455.37
Net national product at market prices	$2009m	355.40	-9112.42	-8757.02
Total imports of goods and services	$2009m	75.85	5680.81	5756.67
Total employment	**ths.**	**4.28**	**-203.34**	**-199.06**
Household activity				
Wages and mixed income	$2009m	170.21	-6441.65	-6271.45
Property income	$2009m	128.49	-2169.01	-2040.51
Direct taxes paid	$2009m	67.21	-1937.40	-1870.19
Household consumption	$2009m	184.68	-5323.87	-5139.19
Government revenue				
Direct taxes on households	$2009m	67.21	-1937.40	-1870.19
Direct taxes on business	$2009m	156.55	-706.87	-550.32
Indirect taxes	$2009m	38.21	-1284.54	-1246.33
Total tax revenue	**$2009m**	**261.96**	**-3928.81**	**-3666.85**
Other indicators				
Income paid overseas	$2009m	229.12	-1295.22	-1066.09
Benefit indicator	$2009m	401.02	-9182.55	-8781.53
Cumulative discounted (at 5%) benefit indicator 2016-2040	$2009m	4629.63	-104509.34	-99879.72

Table A.2 Gross output formation by industry ($2009m)			
	Case study: 50 PJ of natural gas allocated to LNG exports	Case study: 50 PJ of natural gas withdrawn from natural gas dependent industries	Net benefit of reallocating 50 PJ of natural gas from natural gas dependent industries to export
Constrained industries			
Basic chemicals	0.00	-4202.24	-4202.24
Paints	0.00	-98.17	-98.17
Medicinal and pharmaceutical products, pesticides	0.00	-98.77	-98.77
Soap and detergents	0.00	-159.09	-159.09
Cosmetics and toiletry preparations	0.00	-55.37	-55.37
Other chemical products	0.00	-288.82	-288.82
Rubber products	0.00	-40.00	-40.00
Plastic products	0.00	-1847.01	-1847.01
Basic non-ferrous metal and products	0.00	-5951.61	-5951.61
LNG	620.73	0.00	620.73
Unconstrained industries			
Sheep	0.70	-28.13	-27.43
Grains	1.06	-47.17	-46.11
Beef cattle	1.94	-87.10	-85.15
Dairy cattle	1.08	-33.71	-32.62
Pigs	0.27	-10.67	-10.40
Poultry	0.60	-22.74	-22.14
Other agriculture	3.94	-135.46	-131.52
Services to agriculture, hunting and trapping	0.92	-39.85	-38.94
Forestry and logging	0.50	-23.60	-23.11
Commercial fishing	0.63	-18.96	-18.34
Coal	1.79	-80.86	-79.07
Gas	5.80	-83.10	-77.30
Oil	1.47	-65.27	-63.81
Iron ores	0.20	-5.91	-5.71
Non-ferrous metal ores	0.31	-2448.79	-2448.48
Other mining	0.45	-69.09	-68.64
Services to mining	15.45	-281.93	-266.48
Meat and meat products	4.60	-191.72	-187.12
Dairy products	3.54	-110.34	-106.80
Fruit and vegetable products	1.12	-33.81	-32.69
Oils and fats	0.44	-19.27	-18.83
Flour mill products and cereal foods	1.83	-72.38	-70.55
Bakery products	1.51	-45.15	-43.64
Confectionery	1.15	-35.13	-33.98
Other food products	2.69	-100.96	-98.27

Table A.2 Gross output formation by industry ($2009m) – continued

	Case study: 50 PJ of natural gas allocated to LNG exports	Case study: 50 PJ of natural gas withdrawn from natural gas dependent industries	Net benefit of reallocating 50 PJ of natural gas from natural gas dependent industries to export
Soft drinks, cordials and syrups	1.48	-46.55	-45.07
Beer and malt	1.26	-37.46	-36.20
Wine, spirits and tobacco products (a)	1.44	-45.56	-44.12
Textile fibres, yarns and woven fabrics	0.12	-6.26	-6.14
Textile products	0.37	-11.76	-11.38
Knitting mill products	0.26	-8.45	-8.19
Clothing	0.57	-18.84	-18.27
Footwear	0.12	-3.97	-3.85
Leather and leather products	0.09	-3.46	-3.36
Sawmill products	0.54	-16.20	-15.65
Other wood products	1.09	-38.72	-37.63
Pulp, paper and paperboard	0.30	-13.32	-13.01
Paper containers and products	0.90	-47.09	-46.20
Printing and services to printing	2.88	-101.92	-99.04
Publishing, recorded media, etc.	3.29	-122.30	-119.01
Petroleum and coal products	6.35	-282.82	-276.47
Glass and glass products	0.67	-27.41	-26.74
Ceramic products	0.12	-4.41	-4.30
Cement, lime and concrete slurry	0.83	-29.53	-28.70
Plaster and other concrete products	0.43	-15.83	-15.40
Other non-metallic mineral products	0.23	-7.38	-7.16
Iron and steel	4.24	-122.60	-118.36
Structural metal products	2.92	-73.11	-70.19
Sheet metal products	0.91	-37.26	-36.35
Fabricated metal products	2.23	-73.55	-71.32
Motor vehicles and parts, other transport equipment	4.75	-137.15	-132.41
Ships and boats	0.40	-13.72	-13.31
Railway equipment	1.21	-13.28	-12.06
Aircraft	1.39	-21.41	-20.02
Photographic and scientific equipment	0.91	-27.53	-26.62
Electronic equipment	0.83	-24.03	-23.20
Household appliances	1.37	-38.35	-36.98
Other electrical equipment	1.34	-41.45	-40.12
Agricultural, mining, etc. machinery	1.79	-36.27	-34.49
Other machinery and equipment	1.60	-44.46	-42.87
Prefabricated buildings	0.85	-8.07	-7.22
Furniture	1.26	-36.77	-35.51
Other manufacturing	1.07	-57.35	-56.28

Table A.2 Gross output formation by industry ($2009m) – continued

	Case study: 50 PJ of natural gas allocated to LNG exports	Case study: 50 PJ of natural gas withdrawn from natural gas dependent industries	Net benefit of reallocating 50 PJ of natural gas from natural gas dependent industries to export
Electricity supply	10.97	-460.21	-449.24
Gas supply	1.10	-65.39	-64.29
Water supply, sewerage and drainage services	4.06	-157.67	-153.62
Residential building	1.94	-47.42	-45.48
Other construction	3.52	-78.84	-75.32
Construction trade services	19.47	-418.47	-399.00
Wholesale trade	25.88	-1231.10	-1205.22
Wholesale mechanical repairs	2.89	-22.17	-19.28
Other wholesale repairs	5.51	-111.48	-105.97
Retail trade	32.74	-984.54	-951.80
Retail mechanical repairs	7.63	-229.35	-221.72
Other retail repairs	0.44	-13.03	-12.59
Accommodation, cafes and restaurants	16.97	-515.86	-498.90
Road transport	9.58	-489.81	-480.23
Rail, pipeline and other transport	10.02	-111.10	-101.09
Water transport	1.13	-54.45	-53.32
Air and space transport	4.99	-155.51	-150.52
Services to transport, storage	13.62	-496.68	-483.06
Communication services	15.22	-500.67	-485.44
Finance	47.38	-1319.57	-1272.19
Ownership of dwellings	4.72	-135.99	-131.27
Other property services	31.27	-739.24	-707.97
Scientific research, technical and computer services	11.85	-445.16	-433.31
Legal, accounting, marketing and business management services	18.85	-766.52	-747.67
Other business services	11.10	-478.61	-467.51
Government administration	2.21	-99.62	-97.42
Defence	0.03	-1.39	-1.36
Education	9.51	-282.15	-272.63
Health services	9.29	-271.61	-262.32
Community services	1.16	-33.37	-32.21
Motion picture, radio and television services	4.08	-139.92	-135.84
Libraries, museums and the arts	1.11	-36.41	-35.30
Sport, gambling and recreational services	7.78	-192.15	-184.37
Personal services	3.71	-108.00	-104.28
Other services	3.99	-119.36	-115.37
Total	**1082.81**	**-29840.57**	**-28757.76**

Table A.3 Total employment formation (ths)			
	Case study: 50 PJ of natural gas allocated to LNG exports	Case study: 50 PJ of natural gas withdrawn from natural gas dependent industries	Net benefit of reallocating 50 PJ of natural gas from natural gas dependent industries to export
Constrained industries			
Basic chemicals	0.00	-11.20	-11.20
Paints	0.00	-1.00	-1.00
Medicinal and pharmaceutical products, pesticides	0.00	-0.80	-0.80
Soap and detergents	0.00	-0.92	-0.92
Cosmetics and toiletry preparations	0.00	-0.37	-0.37
Other chemical products	0.00	-2.81	-2.81
Rubber products	0.00	-0.35	-0.35
Plastic products	0.00	-16.88	-16.88
Basic non-ferrous metal and products	0.00	-32.47	-32.47
LNG	0.12	0.00	0.12
Unconstrained industries			
Sheep	0.01	-0.47	-0.46
Grains	0.01	-0.41	-0.40
Beef cattle	0.03	-1.24	-1.21
Dairy cattle	0.01	-0.45	-0.43
Pigs	0.01	-0.26	-0.25
Poultry	0.01	-0.20	-0.20
Other agriculture	0.04	-1.28	-1.24
Services to agriculture, hunting and trapping	0.01	-0.29	-0.28
Forestry and logging	0.00	-0.17	-0.16
Commercial fishing	0.00	-0.12	-0.12
Coal	0.00	-0.10	-0.10
Gas	0.00	-0.07	-0.06
Oil	0.00	-0.03	-0.03
Iron ores	0.00	-0.01	-0.01
Non-ferrous metal ores	0.00	-5.15	-5.15
Other mining	0.00	-0.26	-0.25
Services to mining	0.10	-1.88	-1.78
Meat and meat products	0.07	-2.82	-2.75
Dairy products	0.04	-1.17	-1.13
Fruit and vegetable products	0.01	-0.20	-0.19
Oils and fats	0.00	-0.08	-0.08
Flour mill products and cereal foods	0.01	-0.51	-0.50
Bakery products	0.03	-0.97	-0.94
Confectionery	0.01	-0.24	-0.23
Other food products	0.02	-0.63	-0.61

Table A.3 Total employment formation (ths) – continued

	Case study: 50 PJ of natural gas allocated to LNG exports	Case study: 50 PJ of natural gas withdrawn from natural gas dependent industries	Net benefit of reallocating 50 PJ of natural gas from natural gas dependent industries to export
Soft drinks, cordials and syrups	0.01	-0.19	-0.18
Beer and malt	0.00	-0.12	-0.11
Wine, spirits and tobacco products (a)	0.01	-0.17	-0.16
Textile fibres, yarns and woven fabrics	0.00	-0.04	-0.04
Textile products	0.01	-0.16	-0.16
Knitting mill products	0.00	-0.07	-0.07
Clothing	0.01	-0.33	-0.32
Footwear	0.00	-0.04	-0.04
Leather and leather products	0.00	-0.02	-0.02
Sawmill products	0.00	-0.12	-0.12
Other wood products	0.02	-0.58	-0.56
Pulp, paper and paperboard	0.00	-0.05	-0.05
Paper containers and products	0.01	-0.35	-0.34
Printing and services to printing	0.03	-1.01	-0.98
Publishing, recorded media, etc.	0.03	-0.94	-0.92
Petroleum and coal products	0.01	-0.64	-0.63
Glass and glass products	0.01	-0.26	-0.25
Ceramic products	0.00	-0.04	-0.03
Cement, lime and concrete slurry	0.00	-0.12	-0.11
Plaster and other concrete products	0.00	-0.08	-0.08
Other non-metallic mineral products	0.00	-0.09	-0.09
Iron and steel	0.04	-1.10	-1.07
Structural metal products	0.02	-0.45	-0.43
Sheet metal products	0.00	-0.17	-0.16
Fabricated metal products	0.02	-0.78	-0.76
Motor vehicles and parts, other transport equipment	0.05	-1.53	-1.48
Ships and boats	0.00	-0.05	-0.05
Railway equipment	0.00	-0.05	-0.05
Aircraft	0.01	-0.09	-0.08
Photographic and scientific equipment	0.01	-0.29	-0.28
Electronic equipment	0.01	-0.26	-0.25
Household appliances	0.01	-0.33	-0.32
Other electrical equipment	0.01	-0.41	-0.40
Agricultural, mining, etc. machinery	0.02	-0.40	-0.38
Other machinery and equipment	0.02	-0.49	-0.47
Prefabricated buildings	0.01	-0.06	-0.05
Furniture	0.03	-0.89	-0.86
Other manufacturing	0.01	-0.71	-0.70

Table A.3 Total employment formation (ths) – continued

	Case study: 50 PJ of natural gas allocated to LNG exports	Case study: 50 PJ of natural gas withdrawn from natural gas dependent industries	Net benefit of reallocating 50 PJ of natural gas from natural gas dependent industries to export
Electricity supply	0.03	-1.38	-1.35
Gas supply	0.01	-0.55	-0.54
Water supply, sewerage and drainage services	0.02	-0.68	-0.67
Residential building	0.01	-0.23	-0.22
Other construction	0.02	-0.56	-0.53
Construction trade services	0.29	-6.23	-5.94
Wholesale trade	0.19	-9.03	-8.84
Wholesale mechanical repairs	0.02	-0.15	-0.13
Other wholesale repairs	0.05	-0.94	-0.90
Retail trade	0.56	-16.80	-16.24
Retail mechanical repairs	0.20	-6.06	-5.86
Other retail repairs	0.01	-0.28	-0.27
Accommodation, cafes and restaurants	0.25	-7.51	-7.26
Road transport	0.10	-4.86	-4.77
Rail, pipeline and other transport	0.08	-0.89	-0.81
Water transport	0.01	-0.28	-0.28
Air and space transport	0.04	-1.10	-1.07
Services to transport, storage	0.07	-2.57	-2.50
Communication services	0.09	-3.10	-3.01
Finance	0.19	-5.40	-5.20
Ownership of dwellings	0.00	0.00	0.00
Other property services	0.11	-2.51	-2.41
Scientific research, technical and computer services	0.13	-4.86	-4.73
Legal, accounting, marketing and business management services	0.17	-6.95	-6.78
Other business services	0.08	-3.64	-3.55
Government administration	0.03	-1.18	-1.16
Defence	0.00	-0.01	-0.01
Education	0.12	-3.66	-3.54
Health services	0.11	-3.31	-3.20
Community services	0.02	-0.50	-0.48
Motion picture, radio and television services	0.03	-1.08	-1.05
Libraries, museums and the arts	0.02	-0.77	-0.74
Sport, gambling and recreational services	0.11	-2.77	-2.66
Personal services	0.10	-2.77	-2.68
Other services	0.05	-1.43	-1.38
Total	**4.28**	**-203.34**	**-199.06**

Table A.4	General economy responses to 50 PJ suppression of domestic natural gas demand – macroeconomic implications of different adjustment paths							
		Case study: 50 PJ of natural gas allocated to LNG exports	Case study: impact of withdrawing 50 PJ of natural gas – general economy impact full electricity substitution	Net benefit of reallocating 50 PJ of natural gas from natural gas dependent industries to export – full substitution effect	Case study: impact of withdrawing 50 PJ of natural gas – decline in economic activity	Net benefit of reallocating 50 PJ of natural gas from natural gas dependent industries to export – general economy effect – decline in economic activity	Case study: impact of withdrawing 50 PJ of natural gas – gas substitution in electricity production	Net benefit of reallocating 50 PJ of natural gas from natural gas dependent industries to export – general economy effect – gas substitution in electricity production
Macroeconomic aggregates								
Gross domestic product at factor cost	$2009m	729.56	469.54	1199.10	-4658.41	-3928.85	-206.25	523.31
Gross domestic product at market Prices	$2009m	767.76	402.91	1170.67	-5697.53	-4929.77	-282.58	485.18
Gross national product at market prices	$2009m	538.64	211.60	750.23	-5492.32	-4953.68	-296.18	242.45
Net national product at market prices	$2009m	355.40	-3.10	352.30	-4966.96	-4611.56	-307.24	48.16
Total imports of goods and services	$2009m	75.85	-64.14	11.72	-1521.38	-1445.52	-113.45	-37.60
Total employment	**Ths**	**4.28**	**-0.50**	**3.78**	**-92.67**	**-88.39**	**-5.72**	**-1.44**
Household activity								
Wages and mixed income	$2009m	170.21	-1.13	169.07	-3130.00	-2959.80	-209.59	-39.39
Property income	$2009m	128.49	264.86	393.36	-922.44	-793.95	16.41	144.90
Direct taxes paid	$2009m	67.21	59.34	126.55	-911.80	-844.59	-43.47	23.74
Household consumption	$2009m	184.68	-831.59	-646.91	-6410.88	-6226.20	-576.70	-392.02

Table A.4	General economy responses to 50 PJ suppression of domestic natural gas demand – macroeconomic implications of different adjustment paths (continued)							
		Case study: 50 PJ of natural gas allocated to LNG exports	Case study: impact of withdrawing 50 PJ of natural gas – general economy impact full electricity substitution	Net benefit of reallocating 50 PJ of natural gas from natural gas dependent industries to export – full substitution effect	Case study: impact of withdrawing 50 PJ of natural gas – decline in economic activity	Net benefit of reallocating 50 PJ of natural gas from natural gas dependent industries to export – general economy effect – decline in economic activity	Case study: impact of withdrawing 50 PJ of natural gas – gas substitution in electricity production	Net benefit of reallocating 50 PJ of natural gas from natural gas dependent industries to export – general economy effect – gas substitution in electricity production
Government revenue								
Direct taxes on households	$2009m	67.21	59.34	126.55	-911.80	-844.59	-43.47	23.74
Direct taxes on business	$2009m	156.55	-4.20	152.34	-248.23	-91.68	-26.12	130.42
Indirect taxes	$2009m	38.21	-66.63	-28.43	-1039.13	-1000.92	-76.33	-38.13
Total tax revenue	**$2009m**	**261.96**	**-11.50**	**250.46**	**-2199.15**	**-1937.19**	**-145.92**	**116.04**
Other indicators								
Income paid overseas	$2009m	229.12	191.31	420.44	-205.21	23.91	13.60	242.73
Benefit indicator	$2009m	401.02	-423.10	-22.07	-6788.50	-6387.47	-514.93	-113.91
Cumulative discounted (at 5%) benefit indicator 2016-2040	$2009m	4629.63	-6154.42	-1524.79	-90767.69	-86138.06	-6995.04	-2365.42

Table A.5 Gross output formation by industry ($2009m)

	Case study: 50 PJ of natural gas allocated to LNG exports	Case study: impact of withdrawing 50 PJ of natural gas – general economy impact full electricity substitution	Net benefit of reallocating 50 PJ of natural gas from natural gas dependent industries to export – full substitution effect	Case study: impact of withdrawing 50 PJ of natural gas – decline in economic activity	Net benefit of reallocating 50 PJ of natural gas from natural gas dependent industries to export – general economy effect – decline in economic activity	Case study: impact of withdrawing 50 PJ of natural gas – gas substitution in electricity production	Net benefit of reallocating 50 PJ of natural gas from natural gas dependent industries to export – general economy effect – gas substitution in electricity production
Constrained industries							
Basic chemicals	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paints	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Medicinal and pharmaceutical products, pesticides	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Soap and detergents	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cosmetics and toiletry preparations	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other chemical products	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rubber products	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Plastic products	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Basic non-ferrous metal and products	0.00	0.00	0.00	0.00	0.00	0.00	0.00
LNG	620.73	0.00	620.73	0.00	620.73	0.00	620.73
Unconstrained industries							
Sheep	0.70	-2.63	-1.93	-22.11	-21.41	-1.95	-1.25
Grains	1.06	-4.28	-3.22	-34.66	-33.60	-3.08	-2.03
Beef cattle	1.94	-7.93	-5.98	-64.11	-62.17	-5.70	-3.76
Dairy cattle	1.08	-4.48	-3.40	-36.09	-35.01	-3.21	-2.13
Pigs	0.27	-1.06	-0.79	-8.69	-8.43	-0.77	-0.50
Poultry	0.60	-2.48	-1.88	-19.94	-19.34	-1.77	-1.17
Other agriculture	3.94	-16.22	-12.27	-130.01	-126.06	-11.61	-7.66
Services to agriculture, hunting and trapping	0.92	-3.57	-2.65	-29.49	-28.58	-2.61	-1.70
Forestry and logging	0.50	-0.11	0.39	-5.70	-5.20	-0.50	0.00

Table A.5 Gross output formation by industry ($2009m) – continued

	Case study: 50 PJ of natural gas allocated to LNG exports	Case study: impact of withdrawing 50 PJ of natural gas – general economy impact full electricity substitution	Net benefit of reallocating 50 PJ of natural gas from natural gas dependent industries to export – full substitution effect	Case study: impact of withdrawing 50 PJ of natural gas – decline in economic activity	Net benefit of reallocating 50 PJ of natural gas from natural gas dependent industries to export – general economy effect – decline in economic activity	Case study: impact of withdrawing 50 PJ of natural gas – gas substitution in electricity production	Net benefit of reallocating 50 PJ of natural gas from natural gas dependent industries to export – general economy effect – gas substitution in electricity production
Commercial fishing	0.63	-2.68	-2.06	-21.17	-20.54	-1.89	-1.27
Coal	1.79	127.25	129.04	15.40	17.19	38.71	40.50
Gas	5.80	-129.56	-123.77	-201.86	-196.06	-181.74	-175.94
Oil	1.47	0.52	1.98	-32.29	-30.82	-1.75	-0.28
Iron ores	0.20	0.17	0.37	-1.74	-1.54	-0.12	0.08
Non-ferrous metal ores	0.31	0.32	0.64	-3.73	-3.42	-0.20	0.11
Other mining	0.45	1.11	1.57	-4.96	-4.51	-0.08	0.38
Services to mining	15.45	-0.63	14.82	-13.67	1.78	-9.15	6.30
Meat and meat products	4.60	-18.91	-14.32	-152.31	-147.71	-13.56	-8.96
Dairy products	3.54	-14.68	-11.13	-118.18	-114.63	-10.51	-6.96
Fruit and vegetable products	1.12	-4.74	-3.62	-37.59	-36.47	-3.36	-2.24
Oils and fats	0.44	-1.80	-1.36	-14.62	-14.18	-1.30	-0.85
Flour mill products and cereal foods	1.83	-7.51	-5.68	-60.59	-58.75	-5.39	-3.56
Bakery products	1.51	-6.14	-4.63	-49.72	-48.21	-4.42	-2.91
Confectionery	1.15	-4.77	-3.62	-38.27	-37.12	-3.41	-2.26
Other food products	2.69	-10.64	-7.95	-86.71	-84.02	-7.72	-5.03
Soft drinks, cordials and syrups	1.48	-6.47	-4.99	-50.51	-49.04	-4.53	-3.05
Beer and malt	1.26	-5.01	-3.75	-40.88	-39.62	-3.63	-2.37
Wine, spirits and tobacco products (a)	1.44	-5.69	-4.25	-45.81	-44.37	-4.11	-2.67
Textile fibres, yarns and woven fabrics	0.12	-0.31	-0.19	-3.21	-3.09	-0.27	-0.15
Textile products	0.37	-1.33	-0.96	-11.30	-10.93	-1.00	-0.63
Knitting mill products	0.26	-0.99	-0.73	-8.17	-7.91	-0.73	-0.47
Clothing	0.57	-1.75	-1.18	-16.00	-15.43	-1.40	-0.83
Footwear	0.12	-0.31	-0.19	-3.63	-3.50	-0.29	-0.17

Table A.5 Gross output formation by industry ($2009m) – continued

	Case study: 50 PJ of natural gas allocated to LNG exports	Case study: impact of withdrawing 50 PJ of natural gas – general economy impact full electricity substitution	Net benefit of reallocating 50 PJ of natural gas from natural gas dependent industries to export – full substitution effect	Case study: impact of withdrawing 50 PJ of natural gas – decline in economic activity	Net benefit of reallocating 50 PJ of natural gas from natural gas dependent industries to export – general economy effect – decline in economic activity	Case study: impact of withdrawing 50 PJ of natural gas – gas substitution in electricity production	Net benefit of reallocating 50 PJ of natural gas from natural gas dependent industries to export – general economy effect – gas substitution in electricity production
Leather and leather products	0.09	-0.19	-0.09	-2.23	-2.13	-0.19	-0.09
Sawmill products	0.54	0.69	1.23	-8.10	-7.56	-0.36	0.18
Other wood products	1.09	0.98	2.07	-15.03	-13.94	-0.81	0.28
Pulp, paper and paperboard	0.30	-0.54	-0.23	-7.04	-6.73	-0.57	-0.27
Paper containers and products	0.90	-2.32	-1.42	-25.71	-24.82	-2.09	-1.19
Printing and services to printing	2.88	-4.72	-1.84	-67.72	-64.84	-5.35	-2.47
Publishing, recorded media, etc.	3.29	-10.22	-6.93	-95.69	-92.40	-8.23	-4.94
Petroleum and coal products	6.35	2.25	8.60	-139.89	-133.54	-7.58	-1.23
Glass and glass products	0.67	-1.21	-0.54	-15.11	-14.43	-1.26	-0.59
Ceramic products	0.12	0.45	0.57	-1.83	-1.71	0.01	0.13
Cement, lime and concrete slurry	0.83	5.82	6.65	-6.45	-5.62	1.11	1.94
Plaster and other concrete products	0.43	5.95	6.38	-2.71	-2.28	1.50	1.93
Other non-metallic mineral products	0.23	0.52	0.75	-1.92	-1.69	-0.03	0.20
Iron and steel	4.24	3.06	7.29	-35.80	-31.57	-2.61	1.62
Structural metal products	2.92	4.69	7.60	-17.79	-14.87	-0.77	2.15
Sheet metal products	0.91	-0.80	0.11	-15.64	-14.73	-1.28	-0.37
Fabricated metal products	2.23	2.09	4.31	-19.85	-17.62	-1.26	0.97
Motor vehicles and parts, other transport equipment	4.75	-13.68	-8.93	-127.96	-123.21	-11.19	-6.45
Ships and boats	0.40	-0.91	-0.51	-9.75	-9.34	-0.84	-0.43
Railway equipment	1.21	0.70	1.91	-6.24	-5.03	-0.67	0.55
Aircraft	1.39	-1.44	-0.04	-15.97	-14.57	-1.75	-0.36
Photographic and scientific equipment	0.91	-2.04	-1.13	-23.19	-22.28	-1.92	-1.01
Electronic equipment	0.83	-0.42	0.41	-16.44	-15.61	-1.15	-0.32

Table A.5 Gross output formation by industry ($2009m) – continued

	Case study: 50 PJ of natural gas allocated to LNG exports	Case study: impact of withdrawing 50 PJ of natural gas – general economy impact full electricity substitution	Net benefit of reallocating 50 PJ of natural gas from natural gas dependent industries to export – full substitution effect	Case study: impact of withdrawing 50 PJ of natural gas – decline in economic activity	Net benefit of reallocating 50 PJ of natural gas from natural gas dependent industries to export – general economy effect – decline in economic activity	Case study: impact of withdrawing 50 PJ of natural gas – gas substitution in electricity production	Net benefit of reallocating 50 PJ of natural gas from natural gas dependent industries to export – general economy effect – gas substitution in electricity production
Household appliances	1.37	-4.11	-2.74	-38.44	-37.07	-3.33	-1.96
Other electrical equipment	1.34	16.53	17.87	-17.25	-15.92	3.76	5.10
Agricultural, mining, etc. machinery	1.79	0.47	2.26	-10.42	-8.64	-1.19	0.59
Other machinery and equipment	1.60	0.55	2.15	-14.76	-13.16	-1.21	0.39
Prefabricated buildings	0.85	-0.05	0.80	-1.29	-0.44	-0.53	0.32
Furniture	1.26	-4.00	-2.74	-36.28	-35.03	-3.16	-1.91
Other manufacturing	1.07	-0.92	0.14	-21.80	-20.73	-1.62	-0.55
Electricity supply	10.97	1617.38	1628.35	245.05	256.02	500.12	511.09
Gas supply	1.10	22.25	23.35	-21.68	-20.58	5.50	6.60
Water supply, sewerage and drainage services	4.06	-6.94	-2.89	-106.27	-102.21	-8.00	-3.94
Residential building	1.94	9.08	11.02	-18.08	-16.15	1.11	3.05
Other construction	3.52	12.53	16.05	-30.01	-26.49	0.90	4.42
Construction trade services	19.47	134.00	153.47	-124.52	-105.05	26.28	45.75
Wholesale trade	25.88	-26.98	-1.10	-528.97	-503.09	-40.62	-14.74
Wholesale mechanical repairs	2.89	1.57	4.47	-9.40	-6.51	-1.43	1.47
Other wholesale repairs	5.51	3.25	8.76	-44.94	-39.43	-3.57	1.94
Retail trade	32.74	-133.41	-100.67	-1078.70	-1045.95	-95.95	-63.20
Retail mechanical repairs	7.63	-5.42	2.21	-149.57	-141.94	-10.97	-3.35
Other retail repairs	0.44	-1.49	-1.06	-13.13	-12.69	-1.15	-0.71
Accommodation, cafes and restaurants	16.97	-61.52	-44.56	-533.81	-516.84	-46.52	-29.55
Road transport	9.58	-16.59	-7.00	-228.91	-219.32	-18.20	-8.62
Rail, pipeline and other transport	10.02	6.02	16.03	-52.46	-42.45	-5.45	4.57
Water transport	1.13	0.88	2.01	-13.55	-12.41	-0.82	0.32

Table A.5 Gross output formation by industry ($2009m) – continued

	Case study: 50 PJ of natural gas allocated to LNG exports	Case study: impact of withdrawing 50 PJ of natural gas – general economy impact full electricity substitution	Net benefit of reallocating 50 PJ of natural gas from natural gas dependent industries to export – full substitution effect	Case study: impact of withdrawing 50 PJ of natural gas – decline in economic activity	Net benefit of reallocating 50 PJ of natural gas from natural gas dependent industries to export – general economy effect – decline in economic activity	Case study: impact of withdrawing 50 PJ of natural gas – gas substitution in electricity production	Net benefit of reallocating 50 PJ of natural gas from natural gas dependent industries to export – general economy effect – gas substitution in electricity production
Air and space transport	4.99	-13.85	-8.86	-140.33	-135.34	-11.81	-6.81
Services to transport, storage	13.62	-8.85	4.77	-172.10	-158.48	-16.09	-2.47
Communication services	15.22	-24.74	-9.52	-384.41	-369.19	-29.13	-13.90
Finance	47.38	-42.08	5.30	-1081.89	-1034.51	-75.99	-28.61
Ownership of dwellings	4.72	-21.24	-16.52	-163.75	-159.04	-14.73	-10.01
Other property services	31.27	0.18	31.44	-386.50	-355.23	-30.34	0.92
Scientific research, technical and computer services	11.85	7.43	19.28	-139.34	-127.49	-8.99	2.86
Legal, accounting, marketing and business management services	18.85	-4.21	14.63	-349.65	-330.81	-23.61	-4.76
Other business services	11.10	-1.27	9.83	-207.63	-196.53	-13.59	-2.49
Government administration	2.21	-2.87	-0.66	-41.08	-38.87	-3.50	-1.29
Defence	0.03	-0.03	0.00	-0.51	-0.48	-0.04	-0.01
Education	9.51	-30.06	-20.55	-297.24	-287.73	-24.65	-15.13
Health services	9.29	-41.36	-32.08	-320.54	-311.25	-28.80	-19.51
Community services	1.16	-5.21	-4.05	-40.18	-39.02	-3.61	-2.46
Motion picture, radio and television services	4.08	-8.30	-4.21	-101.00	-96.91	-8.25	-4.17
Libraries, museums and the arts	1.11	-1.05	0.06	-29.01	-27.90	-1.92	-0.82
Sport, gambling and recreational services	7.78	-27.59	-19.80	-216.58	-208.80	-20.18	-12.39
Personal services	3.71	-16.27	-12.56	-127.06	-123.35	-11.39	-7.68
Other services	3.99	-16.76	-12.78	-135.57	-131.58	-11.99	-8.00
Total	**1082.81**	**1156.34**	**2239.14**	**-9213.92**	**-8131.11**	**-344.93**	**737.88**

Table A.6 Total employment formation (ths)

	Case study: 50 PJ of natural gas allocated to LNG exports	Case study: impact of withdrawing 50 PJ of natural gas – general economy impact full electricity substitution	Net benefit of reallocating 50 PJ of natural gas from natural gas dependent industries to export – full substitution effect	Case study: impact of withdrawing 50 PJ of natural gas – decline in economic activity	Net benefit of reallocating 50 PJ of natural gas from natural gas dependent industries to export – general economy effect – decline in economic activity	Case study: impact of withdrawing 50 PJ of natural gas – gas substitution in electricity production	Net benefit of reallocating 50 PJ of natural gas from natural gas dependent industries to export – general economy effect – gas substitution in electricity production
Constrained industries							
Basic chemicals	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paints	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Medicinal and pharmaceutical products, pesticides	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Soap and detergents	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cosmetics and toiletry preparations	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other chemical products	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rubber products	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Plastic products	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Basic non-ferrous metal and products	0.00	0.00	0.00	0.00	0.00	0.00	0.00
LNG	0.12	0.00	0.12	0.00	0.12	0.00	0.12
Unconstrained industries							
Sheep	0.01	-0.04	-0.03	-0.37	-0.36	-0.03	-0.02
Grains	0.01	-0.04	-0.03	-0.30	-0.29	-0.03	-0.02
Beef cattle	0.03	-0.11	-0.09	-0.91	-0.89	-0.08	-0.05
Dairy cattle	0.01	-0.06	-0.05	-0.48	-0.46	-0.04	-0.03
Pigs	0.01	-0.03	-0.02	-0.21	-0.20	-0.02	-0.01
Poultry	0.01	-0.02	-0.02	-0.18	-0.17	-0.02	-0.01
Other agriculture	0.04	-0.15	-0.12	-1.23	-1.19	-0.11	-0.07
Services to agriculture, hunting and trapping	0.01	-0.03	-0.02	-0.21	-0.21	-0.02	-0.01
Forestry and logging	0.00	0.00	0.00	-0.04	-0.04	0.00	0.00

Table A.6 Total employment formation (ths) – continued

	Case study: 50 PJ of natural gas allocated to LNG exports	Case study: impact of withdrawing 50 PJ of natural gas – general economy impact full electricity substitution	Net benefit of reallocating 50 PJ of natural gas from natural gas dependent industries to export – full substitution effect	Case study: impact of withdrawing 50 PJ of natural gas – decline in economic activity	Net benefit of reallocating 50 PJ of natural gas from natural gas dependent industries to export – general economy effect – decline in economic activity	Case study: impact of withdrawing 50 PJ of natural gas – gas substitution in electricity production	Net benefit of reallocating 50 PJ of natural gas from natural gas dependent industries to export – general economy effect – gas substitution in electricity production
Commercial fishing	0.00	-0.02	-0.01	-0.14	-0.14	-0.01	-0.01
Coal	0.00	0.16	0.17	0.02	0.02	0.05	0.05
Gas	0.00	-0.11	-0.10	-0.16	-0.16	-0.15	-0.14
Oil	0.00	0.00	0.00	-0.02	-0.01	0.00	0.00
Iron ores	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Non-ferrous metal ores	0.00	0.00	0.00	-0.01	-0.01	0.00	0.00
Other mining	0.00	0.00	0.01	-0.02	-0.02	0.00	0.00
Services to mining	0.10	0.00	0.10	-0.09	0.01	-0.06	0.04
Meat and meat products	0.07	-0.28	-0.21	-2.24	-2.17	-0.20	-0.13
Dairy products	0.04	-0.16	-0.12	-1.25	-1.21	-0.11	-0.07
Fruit and vegetable products	0.01	-0.03	-0.02	-0.22	-0.21	-0.02	-0.01
Oils and fats	0.00	-0.01	-0.01	-0.06	-0.06	-0.01	0.00
Flour mill products and cereal foods	0.01	-0.05	-0.04	-0.43	-0.42	-0.04	-0.03
Bakery products	0.03	-0.13	-0.10	-1.07	-1.03	-0.09	-0.06
Confectionery	0.01	-0.03	-0.02	-0.26	-0.25	-0.02	-0.02
Other food products	0.02	-0.07	-0.05	-0.54	-0.53	-0.05	-0.03
Soft drinks, cordials and syrups	0.01	-0.03	-0.02	-0.20	-0.20	-0.02	-0.01
Beer and malt	0.00	-0.02	-0.01	-0.13	-0.12	-0.01	-0.01
Wine, spirits and tobacco products (a)	0.01	-0.02	-0.02	-0.17	-0.16	-0.02	-0.01
Textile fibres, yarns and woven fabrics	0.00	0.00	0.00	-0.02	-0.02	0.00	0.00
Textile products	0.01	-0.02	-0.01	-0.15	-0.15	-0.01	-0.01
Knitting mill products	0.00	-0.01	-0.01	-0.07	-0.07	-0.01	0.00
Clothing	0.01	-0.03	-0.02	-0.28	-0.27	-0.02	-0.01
Footwear	0.00	0.00	0.00	-0.04	-0.04	0.00	0.00

Table A.6 Total employment formation (ths) – continued

	Case study: 50 PJ of natural gas allocated to LNG exports	Case study: impact of withdrawing 50 PJ of natural gas – general economy impact full electricity substitution	Net benefit of reallocating 50 PJ of natural gas from natural gas dependent industries to export – full substitution effect	Case study: impact of withdrawing 50 PJ of natural gas – decline in economic activity	Net benefit of reallocating 50 PJ of natural gas from natural gas dependent industries to export – general economy effect – decline in economic activity	Case study: impact of withdrawing 50 PJ of natural gas – gas substitution in electricity production	Net benefit of reallocating 50 PJ of natural gas from natural gas dependent industries to export – general economy effect – gas substitution in electricity production
Leather and leather products	0.00	0.00	0.00	-0.01	-0.01	0.00	0.00
Sawmill products	0.00	0.01	0.01	-0.06	-0.06	0.00	0.00
Other wood products	0.02	0.01	0.03	-0.22	-0.21	-0.01	0.00
Pulp, paper and paperboard	0.00	0.00	0.00	-0.02	-0.02	0.00	0.00
Paper containers and products	0.01	-0.02	-0.01	-0.19	-0.18	-0.02	-0.01
Printing and services to printing	0.03	-0.05	-0.02	-0.67	-0.64	-0.05	-0.02
Publishing, recorded media, etc.	0.03	-0.08	-0.05	-0.74	-0.71	-0.06	-0.04
Petroleum and coal products	0.01	0.01	0.02	-0.32	-0.30	-0.02	0.00
Glass and glass products	0.01	-0.01	-0.01	-0.14	-0.14	-0.01	-0.01
Ceramic products	0.00	0.00	0.00	-0.01	-0.01	0.00	0.00
Cement, lime and concrete slurry	0.00	0.02	0.03	-0.03	-0.02	0.00	0.01
Plaster and other concrete products	0.00	0.03	0.03	-0.01	-0.01	0.01	0.01
Other non-metallic mineral products	0.00	0.01	0.01	-0.02	-0.02	0.00	0.00
Iron and steel	0.04	0.03	0.07	-0.32	-0.28	-0.02	0.01
Structural metal products	0.02	0.03	0.05	-0.11	-0.09	0.00	0.01
Sheet metal products	0.00	0.00	0.00	-0.07	-0.07	-0.01	0.00
Fabricated metal products	0.02	0.02	0.05	-0.21	-0.19	-0.01	0.01
Motor vehicles and parts, other transport equipment	0.05	-0.15	-0.10	-1.43	-1.38	-0.12	-0.07
Ships and boats	0.00	0.00	0.00	-0.04	-0.03	0.00	0.00
Railway equipment	0.00	0.00	0.01	-0.03	-0.02	0.00	0.00
Aircraft	0.01	-0.01	0.00	-0.07	-0.06	-0.01	0.00
Photographic and scientific equipment	0.01	-0.02	-0.01	-0.25	-0.24	-0.02	-0.01
Electronic equipment	0.01	0.00	0.00	-0.18	-0.17	-0.01	0.00

Table A.6 Total employment formation (ths) – continued

	Case study: 50 PJ of natural gas allocated to LNG exports	Case study: impact of withdrawing 50 PJ of natural gas – general economy impact full electricity substitution	Net benefit of reallocating 50 PJ of natural gas from natural gas dependent industries to export – full substitution effect	Case study: impact of withdrawing 50 PJ of natural gas – decline in economic activity	Net benefit of reallocating 50 PJ of natural gas from natural gas dependent industries to export – general economy effect – decline in economic activity	Case study: impact of withdrawing 50 PJ of natural gas – gas substitution in electricity production	Net benefit of reallocating 50 PJ of natural gas from natural gas dependent industries to export – general economy effect – gas substitution in electricity production
Household appliances	0.01	-0.04	-0.02	-0.33	-0.32	-0.03	-0.02
Other electrical equipment	0.01	0.16	0.18	-0.17	-0.16	0.04	0.05
Agricultural, mining, etc. machinery	0.02	0.01	0.02	-0.11	-0.09	-0.01	0.01
Other machinery and equipment	0.02	0.01	0.02	-0.16	-0.14	-0.01	0.00
Prefabricated buildings	0.01	0.00	0.01	-0.01	0.00	0.00	0.00
Furniture	0.03	-0.10	-0.07	-0.88	-0.85	-0.08	-0.05
Other manufacturing	0.01	-0.01	0.00	-0.27	-0.26	-0.02	-0.01
Electricity supply	0.03	4.84	4.88	0.73	0.77	1.50	1.53
Gas supply	0.01	0.19	0.20	-0.18	-0.17	0.05	0.06
Water supply, sewerage and drainage services	0.02	-0.03	-0.01	-0.46	-0.44	-0.03	-0.02
Residential building	0.01	0.04	0.05	-0.09	-0.08	0.01	0.02
Other construction	0.02	0.09	0.11	-0.21	-0.19	0.01	0.03
Construction trade services	0.29	1.99	2.28	-1.85	-1.56	0.39	0.68
Wholesale trade	0.19	-0.20	-0.01	-3.88	-3.69	-0.30	-0.11
Wholesale mechanical repairs	0.02	0.01	0.03	-0.06	-0.04	-0.01	0.01
Other wholesale repairs	0.05	0.03	0.07	-0.38	-0.33	-0.03	0.02
Retail trade	0.56	-2.28	-1.72	-18.40	-17.84	-1.64	-1.08
Retail mechanical repairs	0.20	-0.14	0.06	-3.95	-3.75	-0.29	-0.09
Other retail repairs	0.01	-0.03	-0.02	-0.28	-0.27	-0.02	-0.02
Accommodation, cafes and restaurants	0.25	-0.90	-0.65	-7.77	-7.52	-0.68	-0.43
Road transport	0.10	-0.16	-0.07	-2.27	-2.18	-0.18	-0.09
Rail, pipeline and other transport	0.08	0.05	0.13	-0.42	-0.34	-0.04	0.04
Water transport	0.01	0.00	0.01	-0.07	-0.06	0.00	0.00

Table A.6 Total employment formation (ths) – continued

	Case study: 50 PJ of natural gas allocated to LNG exports	Case study: impact of withdrawing 50 PJ of natural gas – general economy impact full electricity substitution	Net benefit of reallocating 50 PJ of natural gas from natural gas dependent industries to export – full substitution effect	Case study: impact of withdrawing 50 PJ of natural gas – decline in economic activity	Net benefit of reallocating 50 PJ of natural gas from natural gas dependent industries to export – general economy effect – decline in economic activity	Case study: impact of withdrawing 50 PJ of natural gas – gas substitution in electricity production	Net benefit of reallocating 50 PJ of natural gas from natural gas dependent industries to export – general economy effect – gas substitution in electricity production
Air and space transport	0.04	-0.10	-0.06	-0.99	-0.96	-0.08	-0.05
Services to transport, storage	0.07	-0.05	0.02	-0.89	-0.82	-0.08	-0.01
Communication services	0.09	-0.15	-0.06	-2.38	-2.29	-0.18	-0.09
Finance	0.19	-0.17	0.02	-4.43	-4.23	-0.31	-0.12
Ownership of dwellings	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other property services	0.11	0.00	0.11	-1.31	-1.21	-0.10	0.00
Scientific research, technical and computer services	0.13	0.08	0.21	-1.52	-1.39	-0.10	0.03
Legal, accounting, marketing and business management services	0.17	-0.04	0.13	-3.17	-3.00	-0.21	-0.04
Other business services	0.08	-0.01	0.07	-1.58	-1.49	-0.10	-0.02
Government administration	0.03	-0.03	-0.01	-0.49	-0.46	-0.04	-0.02
Defence	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Education	0.12	-0.39	-0.27	-3.86	-3.73	-0.32	-0.20
Health services	0.11	-0.50	-0.39	-3.91	-3.79	-0.35	-0.24
Community services	0.02	-0.08	-0.06	-0.60	-0.58	-0.05	-0.04
Motion picture, radio and television services	0.03	-0.06	-0.03	-0.78	-0.75	-0.06	-0.03
Libraries, museums and the arts	0.02	-0.02	0.00	-0.61	-0.59	-0.04	-0.02
Sport, gambling and recreational services	0.11	-0.40	-0.29	-3.12	-3.01	-0.29	-0.18
Personal services	0.10	-0.42	-0.32	-3.26	-3.16	-0.29	-0.20
Other services	0.05	-0.20	-0.15	-1.62	-1.57	-0.14	-0.10
Total	**4.28**	**-0.50**	**3.78**	**-92.67**	**-88.39**	**-5.72**	**-1.44**

Table A.7	Eastern Australian estimates of suppressed gas demand – No East Coast LNG							
	Cumulative suppressed gas demand 2011-2040 – petajoules (PJ)	Average annual suppressed gas demand 2011-2020 – petajoules (PJ)	Average annual suppressed gas demand 2021-2030 – petajoules (PJ)	Average annual suppressed gas demand 2031-2040 – petajoules (PJ)	Average annual ex-plant gas cost $2011 per gigajoule 2011-2020 – petajoules ($/GJ)	Average annual ex-plant gas cost $2011 per gigajoule 2021-2030 – petajoules ($/GJ)	Average annual ex-plant gas cost $2011 per gigajoule 2031-2040 – petajoules ($/GJ)	Suppressed demand as per cent of base case domestic Eastern Australian demand (%)
Aggregate indicators								
Minimum	0	0.0	0.0	0.0	5.4	6.4	7.7	0.0
Maximum	16894	0.0	522.3	1167.1	6.0	8.4	11.4	51.6
Mean	1193	0.0	11.6	107.7	5.6	7.0	9.1	9.5
Std Deviation	2269	0.0	49.1	184.0	0.1	0.4	0.8	9.3
Distribution								
5% Percentile	0	0.0	0.0	0.0	5.4	6.5	8.0	0.0
10% Percentile	0	0.0	0.0	0.0	5.4	6.6	8.1	0.0
15% Percentile	0	0.0	0.0	0.0	5.5	6.6	8.2	0.0
20% Percentile	0	0.0	0.0	0.0	5.5	6.7	8.4	0.0
25% Percentile	0	0.0	0.0	0.0	5.5	6.7	8.4	0.0
30% Percentile	86	0.0	0.0	8.6	5.5	6.8	8.5	3.2
35% Percentile	86	0.0	0.0	8.6	5.5	6.8	8.6	3.2
40% Percentile	254	0.0	0.0	25.4	5.5	6.9	8.7	6.3
45% Percentile	254	0.0	0.0	25.4	5.5	6.9	8.8	6.3
50% Percentile	259	0.0	0.0	25.9	5.6	6.9	8.9	6.3
55% Percentile	499	0.0	0.0	49.9	5.6	7.1	9.1	9.3
60% Percentile	499	0.0	0.0	49.9	5.6	7.1	9.2	9.3
65% Percentile	817	0.0	0.0	81.7	5.6	7.2	9.4	12.2
70% Percentile	817	0.0	0.0	81.7	5.7	7.3	9.5	12.2
75% Percentile	1206	0.0	0.0	120.6	5.7	7.3	9.6	15.0
80% Percentile	1432	0.0	0.0	143.2	5.7	7.4	9.8	15.0
85% Percentile	1661	0.0	0.0	166.1	5.7	7.5	9.9	17.7
90% Percentile	3067	0.0	0.0	304.2	5.8	7.7	10.3	21.2
95% Percentile	6403	0.0	77.6	578.6	5.8	7.8	10.5	28.4

Table A.8 Eastern Australian estimates of suppressed gas demand – East Coast LNG

	Cumulative suppressed gas demand 2011-2040 – petajoules (PJ)	Average annual suppressed gas demand 2011-2020 – petajoules (PJ)	Average annual suppressed gas demand 2021-2030 – petajoules (PJ)	Average annual suppressed gas demand 2031-2040 – petajoules (PJ)	Average annual ex-plant gas cost $2011 per gigajoule 2011-2020 – petajoules ($/GJ)	Average annual ex-plant gas cost $2011 per gigajoule 2021-2030 – petajoules ($/GJ)	Average annual ex-plant gas cost $2011 per gigajoule 2031-2040 – petajoules ($/GJ)	Suppressed demand as per cent of base case domestic Eastern Australian demand (%)
Aggregate indicators								
Minimum	68.9	0.0	0.0	6.9	5.4	6.9	8.9	2.6
Maximum	43585.1	319.9	1752.8	2317.8	6.2	9.2	12.2	94.3
Mean	15170.8	40.2	597.5	883.4	5.7	7.7	10.1	40.8
Std Deviation	10525.2	59.9	450.0	562.1	0.1	0.4	0.6	19.5
Distribution								
5% Percentile	929.1	0.0	0.0	64.1	5.5	7.0	9.2	11.9
10% Percentile	1556.5	0.0	0.0	155.6	5.5	7.2	9.4	15.7
15% Percentile	2148.3	0.0	0.0	187.4	5.5	7.2	9.5	19.3
20% Percentile	2824.3	0.0	52.4	255.5	5.5	7.3	9.6	22.8
25% Percentile	5071.4	0.0	165.3	345.5	5.6	7.4	9.7	24.3
30% Percentile	7641.6	0.0	252.8	494.9	5.6	7.5	9.8	27.0
35% Percentile	9767.5	0.0	361.8	612.4	5.6	7.5	9.9	31.0
40% Percentile	11838.2	0.0	455.0	727.0	5.6	7.6	10.0	33.8
45% Percentile	13520.0	0.0	529.8	811.2	5.6	7.6	10.1	37.2
50% Percentile	15089.4	0.0	609.6	885.4	5.6	7.7	10.1	39.7
55% Percentile	16447.8	8.9	669.9	979.8	5.7	7.7	10.2	42.4
60% Percentile	17998.8	24.6	744.7	1030.2	5.7	7.8	10.3	44.6
65% Percentile	19676.0	38.2	824.7	1112.7	5.7	7.8	10.4	47.6
70% Percentile	21718.6	50.2	888.4	1209.7	5.7	7.9	10.4	51.2
75% Percentile	23340.6	63.7	952.3	1324.2	5.8	8.0	10.5	55.1
80% Percentile	25130.9	82.2	1031.1	1413.9	5.8	8.0	10.6	58.5
85% Percentile	27283.7	110.0	1113.1	1540.5	5.8	8.2	10.7	63.7
90% Percentile	29833.6	136.4	1222.5	1659.1	5.9	8.3	10.9	68.3
95% Percentile	33126.2	169.5	1339.2	1826.5	6.0	8.5	11.2	75.1

Table A.9	Eastern Australian estimates of suppressed gas demand – Impact of East Coast LNG							
	Cumulative suppressed gas demand 2011-2040 – petajoules (PJ)	Average annual suppressed gas demand 2011-2020 – petajoules (PJ)	Average annual suppressed gas demand 2021-2030 – petajoules (PJ)	Average annual suppressed gas demand 2031-2040 – petajoules (PJ)	Average annual ex-plant gas cost $2011 per gigajoule 2011-2020 – petajoules ($/GJ)	Average annual ex-plant gas cost $2011 per gigajoule 2021-2030 – petajoules ($/GJ)	Average annual ex-plant gas cost $2011 per gigajoule 2031-2040 – petajoules ($/GJ)	Suppressed demand as per cent of base case domestic Eastern Australian demand (%)
Aggregate indicators								
Minimum	68.9	0.0	0.0	6.9	0.0	0.5	1.1	2.6
Maximum	26691.3	319.9	1230.5	1150.7	0.2	0.8	0.8	42.7
Mean	13977.5	40.2	585.9	775.7	0.1	0.7	1.1	31.3
Std Deviation	8255.9	59.9	400.9	378.1	0.0	0.0	-0.2	10.2
Distribution								
5% Percentile	929.1	0.0	0.0	64.1	0.0	0.5	1.2	11.9
10% Percentile	1556.5	0.0	0.0	155.6	0.1	0.6	1.3	15.7
15% Percentile	2148.3	0.0	0.0	187.4	0.1	0.6	1.3	19.3
20% Percentile	2824.3	0.0	52.4	255.5	0.1	0.6	1.3	22.8
25% Percentile	5071.4	0.0	165.3	345.5	0.1	0.7	1.3	24.3
30% Percentile	7555.6	0.0	252.8	486.3	0.1	0.7	1.3	23.8
35% Percentile	9681.5	0.0	361.8	603.8	0.1	0.7	1.3	27.8
40% Percentile	11584.7	0.0	455.0	701.7	0.1	0.7	1.3	27.4
45% Percentile	13266.5	0.0	529.8	785.8	0.1	0.7	1.3	30.9
50% Percentile	14830.2	0.0	609.6	859.5	0.1	0.7	1.2	33.4
55% Percentile	15949.2	8.9	669.9	930.0	0.1	0.7	1.1	33.0
60% Percentile	17500.2	24.6	744.7	980.4	0.1	0.7	1.1	35.3
65% Percentile	18858.7	38.2	824.7	1031.0	0.1	0.6	1.0	35.4
70% Percentile	20901.2	50.2	888.4	1128.0	0.1	0.6	0.9	39.0
75% Percentile	22134.6	63.7	952.3	1203.6	0.1	0.6	0.9	40.1
80% Percentile	23698.6	82.2	1031.1	1270.6	0.1	0.6	0.8	43.5
85% Percentile	25622.9	110.0	1113.1	1374.5	0.1	0.7	0.8	46.0
90% Percentile	26767.1	136.4	1222.5	1354.9	0.1	0.6	0.6	47.1
95% Percentile	26723.0	169.5	1261.6	1247.8	0.1	0.7	0.7	46.7

Table A.10 Eastern Australian estimates of suppressed gas demand – No East Coast LNG

	Gross domestic product at market prices (2009 $m) – 2020	Gross domestic product at market prices (2009 $m) – 2040	Total employment (ths) – 2020	Total employment (ths) – 2020	Benefit indicator (2009 $m) – 2020	Benefit indicator (2009 $m) – 2040	Cumulative discounted net benefit indicator (5% rate) (2009 $m) 2012 – 2040	Ultimately recoverable reserves (2009 $m)	Estimates of eventually recoverable reserves as at 2012 (PJ)
Aggregate indicators									
Minimum	-26636	-109626	-672	-2161	-40493	-127105	-797201	94208	91288.9
Maximum	15118	18445	82	103	7744	9647	101184	265838	263437.8
Mean	8339	-33424	-47	-837	-319	-49917	-196062	173479	173481.8
Std Deviation	9292	28332	174	505	10880	31851	212661	36543	36426.9
Distribution									
5% Percentile	-10823	-79109	-391	-1647	-21041	-98005	-561368	115734	115200.3
10% Percentile	-3839	-69326	-279	-1477	-16162	-89901	-492412	125386	125942.1
15% Percentile	-1816	-65155	-243	-1409	-12573	-84793	-433361	133987	134066.2
20% Percentile	-75	-56463	-213	-1263	-10853	-78436	-382385	140845	140810.0
25% Percentile	1720	-52830	-179	-1208	-8621	-73908	-342773	147117	146886.9
30% Percentile	3493	-49945	-131	-1131	-5658	-69629	-313076	151931	152278.0
35% Percentile	5639	-44308	-94	-1038	-3384	-66274	-292924	157163	157293.8
40% Percentile	10072	-41612	-20	-1002	1577	-61076	-263167	161852	161965.7
45% Percentile	13688	-40193	54	-940	5990	-55411	-227867	166430	166397.9
50% Percentile	15118	-35602	82	-869	7744	-52388	-197998	170863	171161.4
55% Percentile	15118	-32403	82	-824	7744	-47911	-168263	176278	176066.5
60% Percentile	15118	-28204	82	-758	7744	-44830	-130813	181130	181323.1
65% Percentile	15118	-21513	82	-637	7744	-37388	-92761	186871	186829.0
70% Percentile	15118	-15515	82	-518	7744	-30791	-39563	192865	192840.7
75% Percentile	15118	-10561	82	-428	7744	-23149	-14712	199282	199367.6
80% Percentile	15118	-5415	82	-331	7744	-18460	25583	206500	206442.7
85% Percentile	15118	593	82	-221	7744	-10114	85246	214882	214675.4
90% Percentile	15118	6777	82	-108	7744	-3718	94371	223848	224387.3
95% Percentile	15118	12600	82	-13	7744	2518	98438	237320	236890.6

Table A.11 Queensland natural gas expansion – the expected net benefit on the national economy (with year benchmarks)							
		2015	**2020**	**2025**	**2030**	**2035**	**2040**
Macroeconomic aggregates							
Gross domestic product at factor cost	$2009m	0.0	14395.9	-3791.9	-6697.9	-8918.8	-22009.2
Gross domestic product at market prices	$2009m	0.0	15117.7	-7326.3	-10834.4	-13496.1	-29253.7
Gross national product at market prices	$2009m	0.0	10544.6	-12045.5	-15406.3	-17962.4	-33181.2
Net national product at market prices	$2009m	0.0	6903.3	-14433.9	-17458.7	-19785.0	-33728.5
Total imports of goods and services	$2009m	0.0	1455.2	6083.9	5781.5	6262.0	9284.3
Total employment	**ths.**	**0.0**	**81.8**	**-375.2**	**-434.3**	**-482.8**	**-774.6**
Household activity							
Wages and mixed income	$2009m	0.0	3275.8	-11437.0	-13396.2	-14975.8	-24450.8
Property income	$2009m	0.0	2528.8	352.4	-179.0	-480.5	-2156.4
Direct taxes paid	$2009m	0.0	1306.0	-2494.0	-3054.4	-3477.7	-5986.6
Household consumption	$2009m	0.0	3436.6	-22827.7	-26451.1	-29099.2	-45299.7
Government revenue							
Direct taxes on households	$2009m	0.0	1306.0	-2494.0	-3054.4	-3477.7	-5986.6
Direct taxes on business	$2009m	0.0	3121.2	2176.4	2004.9	1841.8	860.5
Indirect taxes	$2009m	0.0	721.8	-3534.3	-4136.5	-4577.3	-7244.5
Total tax revenue	**$2009m**	**0.0**	**5149.0**	**-3851.9**	**-5186.0**	**-6213.2**	**-12370.6**
Other indicators							
Income paid overseas	$2009m	0.0	4573.1	4719.2	4571.9	4466.3	3927.6
Benefit indicator	$2009m	0.0	7744.4	-20556.8	-24547.9	-27548.7	-45699.4
Cumulative discounted (at 5%) benefit indicator 2016-2040	$2009m	0.0	0.0	0.0	0.0	0.0	-160043.6

Table A.12 The impact of East Coast LNG exports on the national economy: Gross output formation by industry ($2009m)						
	2015	2020	2025	2030	2035	2040
Constrained industries						
Basic chemicals	0.0	0.0	-5867.8	-6185.3	-6801.4	-10581.1
Paints	0.0	0.0	-137.1	-144.5	-158.9	-247.2
Medicinal and pharmaceutical products, pesticides	0.0	0.0	-137.9	-145.4	-159.9	-248.7
Soap and detergents	0.0	0.0	-222.1	-234.2	-257.5	-400.6
Cosmetics and toiletry preparations	0.0	0.0	-77.3	-81.5	-89.6	-139.4
Other chemical products	0.0	0.0	-403.3	-425.1	-467.5	-727.2
Rubber products	0.0	0.0	-55.9	-58.9	-64.7	-100.7
Plastic products	0.0	0.0	-2579.1	-2718.6	-2989.4	-4650.7
Basic non-ferrous metal and products	0.0	0.0	-8310.6	-8760.2	-9632.7	-14985.9
LNG	0.0	12414.5	14897.5	14897.5	14897.5	14897.5
Unconstrained industries						
Sheep	0.0	13.0	-89.1	-102.3	-112.7	-176.2
Grains	0.0	19.7	-146.0	-167.0	-183.8	-286.9
Beef cattle	0.0	36.3	-270.2	-308.9	-340.1	-530.7
Dairy cattle	0.0	20.2	-131.1	-151.8	-167.1	-260.7
Pigs	0.0	5.0	-34.8	-40.0	-44.0	-68.8
Poultry	0.0	11.2	-78.2	-89.9	-98.9	-154.4
Other agriculture	0.0	73.7	-491.7	-567.1	-624.4	-974.7
Services to agriculture, hunting and trapping	0.0	17.1	-122.9	-140.7	-154.9	-242.1
Forestry and logging	0.0	9.7	-34.2	-38.7	-43.5	-72.3
Commercial fishing	0.0	11.7	-76.5	-88.5	-97.4	-151.9
Coal	0.0	34.9	1028.6	1061.6	1150.7	1749.2
Gas	0.0	115.1	-2135.4	-2272.8	-2519.9	-4005.1
Oil	0.0	28.0	-117.6	-137.5	-153.1	-246.0
Iron ores	0.0	4.0	-5.8	-7.0	-8.2	-14.9
Non-ferrous metal ores	0.0	6.1	-3417.2	-3603.8	-3963.4	-6168.9
Other mining	0.0	8.8	-87.0	-94.3	-104.6	-167.1

Table A.12 The impact of East Coast LNG exports on the national economy: Gross output formation by industry ($2009m) – continued						
	2015	2020	2025	2030	2035	2040
Services to mining	0.0	308.8	-97.0	-125.1	-175.6	-479.9
Meat and meat products	0.0	85.8	-621.9	-712.7	-784.6	-1224.3
Dairy products	0.0	66.1	-429.4	-496.9	-547.1	-853.6
Fruit and vegetable products	0.0	20.9	-135.5	-156.9	-172.7	-269.4
Oils and fats	0.0	8.2	-60.8	-69.5	-76.6	-119.5
Flour mill products and cereal foods	0.0	34.2	-241.8	-277.6	-305.6	-476.9
Bakery products	0.0	28.2	-178.2	-206.5	-227.4	-355.1
Confectionery	0.0	21.5	-138.3	-160.1	-176.3	-275.1
Other food products	0.0	50.3	-340.0	-391.0	-430.7	-673.1
Soft drinks, cordials and syrups	0.0	27.6	-185.1	-214.0	-235.5	-366.9
Beer and malt	0.0	23.5	-146.3	-169.6	-186.8	-291.9
Wine, spirits and tobacco products (a)	0.0	27.0	-168.9	-195.3	-215.2	-336.7
Textile fibres, yarns and woven fabrics	0.0	2.3	-14.9	-17.0	-18.8	-29.6
Textile products	0.0	7.0	-41.4	-47.9	-52.9	-82.9
Knitting mill products	0.0	4.8	-30.3	-35.0	-38.6	-60.4
Clothing	0.0	10.7	-59.7	-69.1	-76.3	-120.3
Footwear	0.0	2.3	-12.6	-14.6	-16.2	-25.4
Leather and leather products	0.0	1.8	-8.7	-10.0	-11.1	-17.8
Sawmill products	0.0	10.6	-20.8	-25.6	-29.1	-49.8
Other wood products	0.0	21.1	-51.5	-61.3	-69.3	-117.1
Pulp, paper and paperboard	0.0	5.8	-30.2	-34.6	-38.4	-61.2
Paper containers and products	0.0	16.9	-115.6	-131.9	-145.5	-228.7
Printing and services to printing	0.0	54.8	-250.9	-291.6	-323.5	-516.7
Publishing, recorded media, etc.	0.0	62.0	-370.7	-427.5	-471.8	-741.9
Petroleum and coal products	0.0	121.2	-509.4	-596.0	-663.2	-1066.0
Glass and glass products	0.0	12.8	-63.2	-72.7	-80.6	-128.8
Ceramic products	0.0	2.2	-3.4	-4.4	-5.1	-8.9
Cement, lime and concrete slurry	0.0	16.3	13.1	9.3	8.0	3.1
Plaster and other concrete products	0.0	8.4	32.1	31.1	32.7	45.6

Table A.12 The impact of East Coast LNG exports on the national economy: Gross output formation by industry ($2009m) – continued						
	2015	2020	2025	2030	2035	2040
Other non-metallic mineral products	0.0	4.4	-4.8	-6.1	-7.2	-13.7
Iron and steel	0.0	83.3	-124.1	-149.5	-173.2	-314.2
Structural metal products	0.0	57.6	-34.7	-47.5	-58.9	-125.3
Sheet metal products	0.0	17.6	-69.4	-79.8	-89.0	-145.0
Fabricated metal products	0.0	43.7	-75.9	-90.2	-103.8	-184.8
Motor vehicles and parts, other transport equipment	0.0	89.8	-451.6	-525.6	-581.1	-919.4
Ships and boats	0.0	7.7	-37.0	-42.8	-47.4	-75.6
Railway equipment	0.0	24.0	1.2	-2.6	-5.6	-23.1
Aircraft	0.0	27.3	-43.0	-52.5	-60.2	-106.6
Photographic and scientific equipment	0.0	17.3	-80.8	-94.3	-104.4	-166.0
Electronic equipment	0.0	15.9	-51.0	-60.7	-67.8	-110.6
Household appliances	0.0	25.9	-132.9	-154.9	-171.1	-270.0
Other electrical equipment	0.0	25.8	76.9	69.8	73.0	100.4
Agricultural, mining, etc. machinery	0.0	35.3	-28.7	-36.2	-43.8	-88.7
Other machinery and equipment	0.0	31.4	-51.8	-62.0	-71.3	-127.3
Prefabricated buildings	0.0	17.0	3.9	2.7	0.9	-9.9
Furniture	0.0	23.7	-128.0	-148.8	-164.3	-258.8
Other manufacturing	0.0	20.5	-107.0	-121.8	-135.3	-216.7
Electricity supply	0.0	209.5	13710.6	14196.4	15426.2	23620.7
Gas supply	0.0	20.8	78.2	68.7	72.1	103.4
Water supply, sewerage and drainage services	0.0	76.8	-396.4	-460.1	-509.2	-806.9
Residential building	0.0	37.9	16.9	7.0	3.1	-15.5
Other construction	0.0	69.1	12.9	-4.1	-12.7	-57.7
Construction trade services	0.0	382.9	721.2	664.5	677.3	822.6
Wholesale trade	0.0	496.1	-2411.8	-2760.3	-3066.7	-4922.9
Wholesale mechanical repairs	0.0	57.5	25.7	20.0	15.1	-12.7
Other wholesale repairs	0.0	108.4	-97.4	-126.2	-150.3	-292.6
Retail trade	0.0	611.5	-3874.5	-4489.3	-4943.5	-7719.1
Retail mechanical repairs	0.0	146.5	-490.9	-579.9	-647.6	-1054.8

Table A.12 The impact of East Coast LNG exports on the national economy: Gross output formation by industry ($2009m) – continued						
	2015	**2020**	**2025**	**2030**	**2035**	**2040**
Other retail repairs	0.0	8.2	-46.7	-54.2	-59.8	-94.0
Accommodation, cafes and restaurants	0.0	317.8	-1903.2	-2208.5	-2434.2	-3811.9
Road transport	0.0	182.4	-1059.5	-1208.2	-1337.7	-2124.3
Rail, pipeline and other transport	0.0	198.3	7.8	-23.9	-48.9	-194.1
Water transport	0.0	22.1	-70.6	-80.9	-91.0	-152.1
Air and space transport	0.0	94.2	-497.3	-578.4	-639.1	-1008.3
Services to transport, storage	0.0	265.5	-809.1	-929.8	-1045.8	-1747.7
Communication services	0.0	288.8	-1322.0	-1546.7	-1714.2	-2727.7
Finance	0.0	903.3	-3266.8	-3885.7	-4324.4	-6963.1
Ownership of dwellings	0.0	87.8	-583.1	-675.6	-743.3	-1157.1
Other property services	0.0	609.7	-1108.0	-1345.8	-1535.6	-2671.3
Scientific research, technical and computer services	0.0	231.3	-574.5	-671.9	-761.0	-1294.2
Legal, accounting, marketing and business management services	0.0	362.6	-1376.3	-1599.8	-1785.5	-2903.2
Other business services	0.0	213.5	-841.6	-975.7	-1088.4	-1766.6
Government administration	0.0	42.5	-195.3	-222.8	-247.9	-400.1
Defence	0.0	0.5	-2.6	-2.9	-3.2	-5.2
Education	0.0	178.2	-1015.8	-1184.4	-1306.1	-2047.0
Health services	0.0	172.9	-1146.0	-1327.5	-1460.6	-2274.4
Community services	0.0	21.5	-143.1	-165.8	-182.4	-283.9
Motion picture, radio and television services	0.0	77.6	-372.4	-432.5	-479.2	-762.5
Libraries, museums and the arts	0.0	20.9	-91.8	-108.4	-120.2	-191.1
Sport, gambling and recreational services	0.0	147.0	-751.3	-874.5	-966.0	-1525.0
Personal services	0.0	69.1	-453.0	-524.9	-577.6	-899.9
Other services	0.0	74.3	-483.5	-560.5	-616.8	-961.4
Total	**0.000**	**21268**	**-25534**	**-31834**	**-37239**	**-69242**

Table A.13 The impact of East Coast LNG exports on the national economy: Total employment formation (ths)						
	2015	**2020**	**2025**	**2030**	**2035**	**2040**
Constrained industries						
Basic chemicals	0.000	0.000	-15.639	-16.485	-18.127	-28.201
Paints	0.000	0.000	-1.390	-1.465	-1.611	-2.506
Medicinal and pharmaceutical products, pesticides	0.000	0.000	-1.115	-1.175	-1.292	-2.010
Soap and detergents	0.000	0.000	-1.288	-1.358	-1.493	-2.322
Cosmetics and toiletry preparations	0.000	0.000	-0.523	-0.551	-0.606	-0.943
Other chemical products	0.000	0.000	-3.920	-4.133	-4.544	-7.069
Rubber products	0.000	0.000	-0.485	-0.512	-0.563	-0.875
Plastic products	0.000	0.000	-23.566	-24.841	-27.315	-42.495
Basic non-ferrous metal and products	0.000	0.000	-45.336	-47.789	-52.549	-81.751
LNG	0.000	2.359	2.831	2.831	2.831	2.831
Unconstrained industries						
Sheep	0.000	0.217	-1.483	-1.702	-1.875	-2.933
Grains	0.000	0.170	-1.260	-1.441	-1.587	-2.477
Beef cattle	0.000	0.517	-3.850	-4.401	-4.845	-7.561
Dairy cattle	0.000	0.268	-1.740	-2.014	-2.217	-3.460
Pigs	0.000	0.120	-0.834	-0.958	-1.055	-1.648
Poultry	0.000	0.101	-0.704	-0.810	-0.892	-1.391
Other agriculture	0.000	0.697	-4.652	-5.365	-5.907	-9.222
Services to agriculture, hunting and trapping	0.000	0.124	-0.891	-1.019	-1.123	-1.754
Forestry and logging	0.000	0.069	-0.244	-0.276	-0.310	-0.515
Commercial fishing	0.000	0.077	-0.503	-0.582	-0.641	-0.999
Coal	0.000	0.045	1.330	1.373	1.488	2.262
Gas	0.000	0.094	-1.743	-1.855	-2.057	-3.269
Oil	0.000	0.013	-0.055	-0.064	-0.072	-0.115
Iron ores	0.000	0.004	-0.006	-0.007	-0.008	-0.014
Non-ferrous metal ores	0.000	0.013	-7.191	-7.584	-8.340	-12.981
Other mining	0.000	0.033	-0.323	-0.350	-0.388	-0.620

Table A.13 The impact of East Coast LNG exports on the national economy: Total employment formation (ths) – continued						
	2015	2020	2025	2030	2035	2040
Services to mining	0.000	2.059	-0.647	-0.834	-1.171	-3.200
Meat and meat products	0.000	1.262	-9.148	-10.484	-11.542	-18.009
Dairy products	0.000	0.701	-4.549	-5.264	-5.796	-9.043
Fruit and vegetable products	0.000	0.120	-0.782	-0.905	-0.996	-1.554
Oils and fats	0.000	0.036	-0.267	-0.306	-0.337	-0.526
Flour mill products and cereal foods	0.000	0.242	-1.712	-1.965	-2.164	-3.377
Bakery products	0.000	0.605	-3.822	-4.429	-4.877	-7.616
Confectionery	0.000	0.146	-0.940	-1.088	-1.198	-1.870
Other food products	0.000	0.315	-2.127	-2.447	-2.695	-4.212
Soft drinks, cordials and syrups	0.000	0.112	-0.750	-0.867	-0.954	-1.486
Beer and malt	0.000	0.074	-0.459	-0.532	-0.586	-0.915
Wine, spirits and tobacco products (a)	0.000	0.100	-0.626	-0.724	-0.798	-1.248
Textile fibres, yarns and woven fabrics	0.000	0.014	-0.089	-0.102	-0.113	-0.178
Textile products	0.000	0.096	-0.565	-0.654	-0.722	-1.133
Knitting mill products	0.000	0.041	-0.256	-0.295	-0.326	-0.510
Clothing	0.000	0.186	-1.036	-1.199	-1.324	-2.087
Footwear	0.000	0.024	-0.130	-0.152	-0.168	-0.264
Leather and leather products	0.000	0.011	-0.051	-0.059	-0.065	-0.104
Sawmill products	0.000	0.081	-0.159	-0.197	-0.224	-0.382
Other wood products	0.000	0.315	-0.766	-0.911	-1.031	-1.742
Pulp, paper and paperboard	0.000	0.020	-0.105	-0.120	-0.133	-0.212
Paper containers and products	0.000	0.126	-0.861	-0.982	-1.084	-1.703
Printing and services to printing	0.000	0.542	-2.480	-2.883	-3.198	-5.107
Publishing, recorded media, etc.	0.000	0.478	-2.861	-3.299	-3.641	-5.726
Petroleum and coal products	0.000	0.275	-1.155	-1.352	-1.504	-2.418
Glass and glass products	0.000	0.121	-0.598	-0.688	-0.763	-1.219
Ceramic products	0.000	0.018	-0.027	-0.036	-0.042	-0.072
Cement, lime and concrete slurry	0.000	0.064	0.052	0.037	0.032	0.012
Plaster and other concrete products	0.000	0.042	0.159	0.155	0.163	0.227

Table A.13 The impact of East Coast LNG exports on the national economy: Total employment formation (ths) – continued						
	2015	**2020**	**2025**	**2030**	**2035**	**2040**
Other non-metallic mineral products	0.000	0.055	-0.060	-0.076	-0.090	-0.170
Iron and steel	0.000	0.749	-1.117	-1.345	-1.559	-2.828
Structural metal products	0.000	0.357	-0.215	-0.294	-0.365	-0.776
Sheet metal products	0.000	0.079	-0.312	-0.359	-0.400	-0.652
Fabricated metal products	0.000	0.463	-0.803	-0.955	-1.099	-1.956
Motor vehicles and parts, other transport equipment	0.000	1.002	-5.043	-5.868	-6.488	-10.266
Ships and boats	0.000	0.028	-0.136	-0.157	-0.174	-0.277
Railway equipment	0.000	0.097	0.005	-0.011	-0.023	-0.093
Aircraft	0.000	0.113	-0.179	-0.219	-0.250	-0.444
Photographic and scientific equipment	0.000	0.186	-0.864	-1.009	-1.117	-1.776
Electronic equipment	0.000	0.174	-0.560	-0.665	-0.744	-1.212
Household appliances	0.000	0.223	-1.146	-1.335	-1.475	-2.329
Other electrical equipment	0.000	0.255	0.761	0.690	0.722	0.992
Agricultural, mining, etc. machinery	0.000	0.387	-0.315	-0.398	-0.480	-0.973
Other machinery and equipment	0.000	0.343	-0.566	-0.678	-0.780	-1.393
Prefabricated buildings	0.000	0.129	0.030	0.020	0.007	-0.075
Furniture	0.000	0.575	-3.104	-3.609	-3.985	-6.276
Other manufacturing	0.000	0.255	-1.333	-1.517	-1.685	-2.700
Electricity supply	0.000	0.627	41.056	42.510	46.193	70.731
Gas supply	0.000	0.175	0.659	0.578	0.607	0.871
Water supply, sewerage and drainage services	0.000	0.333	-1.717	-1.992	-2.205	-3.494
Residential building	0.000	0.187	0.083	0.035	0.016	-0.077
Other construction	0.000	0.489	0.091	-0.029	-0.090	-0.409
Construction trade services	0.000	5.699	10.736	9.891	10.081	12.245
Wholesale trade	0.000	3.638	-17.687	-20.242	-22.490	-36.102
Wholesale mechanical repairs	0.000	0.393	0.176	0.137	0.103	-0.087
Other wholesale repairs	0.000	0.917	-0.824	-1.068	-1.272	-2.476
Retail trade	0.000	10.433	-66.102	-76.590	-84.339	-131.692
Retail mechanical repairs	0.000	3.870	-12.971	-15.323	-17.111	-27.872

Table A.13 The impact of East Coast LNG exports on the national economy: Total employment formation (ths) – continued						
	2015	**2020**	**2025**	**2030**	**2035**	**2040**
Other retail repairs	0.000	0.178	-1.011	-1.174	-1.295	-2.034
Accommodation, cafes and restaurants	0.000	4.627	-27.705	-32.149	-35.435	-55.489
Road transport	0.000	1.811	-10.521	-11.998	-13.284	-21.095
Rail, pipeline and other transport	0.000	1.595	0.062	-0.192	-0.393	-1.562
Water transport	0.000	0.115	-0.367	-0.420	-0.473	-0.790
Air and space transport	0.000	0.667	-3.522	-4.097	-4.527	-7.142
Services to transport, storage	0.000	1.374	-4.185	-4.810	-5.410	-9.041
Communication services	0.000	1.790	-8.192	-9.585	-10.622	-16.902
Finance	0.000	3.695	-13.364	-15.896	-17.690	-28.485
Ownership of dwellings	0.000	0.000	0.000	0.000	0.000	0.000
Other property services	0.000	2.074	-3.768	-4.577	-5.223	-9.085
Scientific research, technical and computer services	0.000	2.527	-6.278	-7.342	-8.316	-14.143
Legal, accounting, marketing and business management services	0.000	3.290	-12.487	-14.514	-16.199	-26.339
Other business services	0.000	1.622	-6.394	-7.413	-8.270	-13.423
Government administration	0.000	0.504	-2.316	-2.643	-2.941	-4.746
Defence	0.000	0.004	-0.020	-0.022	-0.025	-0.040
Education	0.000	2.312	-13.176	-15.362	-16.941	-26.552
Health services	0.000	2.107	-13.971	-16.184	-17.807	-27.729
Community services	0.000	0.322	-2.138	-2.478	-2.726	-4.243
Motion picture, radio and television services	0.000	0.599	-2.876	-3.341	-3.701	-5.890
Libraries, museums and the arts	0.000	0.441	-1.935	-2.286	-2.534	-4.029
Sport, gambling and recreational services	0.000	2.120	-10.832	-12.609	-13.928	-21.989
Personal services	0.000	1.774	-11.621	-13.467	-14.819	-23.087
Other services	0.000	0.889	-5.786	-6.707	-7.381	-11.505
Total	**0.000**	**81.816**	**-375.199**	**-434.261**	**-482.785**	**-774.619**

Table A.14 East Coast LNG expansion: Gross output formation by industry ($2009m)			
	Case study: 50 PJ of natural gas allocated to LNG exports – base case prices	Case study: 50 PJ of natural gas allocated to LNG exports – 20% reduction in base case prices	Net benefit of 50 PJ of LNG exports with 20% reduction in base case prices
Constrained industries			
Basic chemicals	0.00	0.00	0.00
Paints	0.00	0.00	0.00
Medicinal and pharmaceutical products, pesticides	0.00	0.00	0.00
Soap and detergents	0.00	0.00	0.00
Cosmetics and toiletry preparations	0.00	0.00	0.00
Other chemical products	0.00	0.00	0.00
Rubber products	0.00	0.00	0.00
Plastic products	0.00	0.00	0.00
Basic non-ferrous metal and products	0.00	0.00	0.00
LNG	620.73	-124.15	496.58
Unconstrained industries			
Sheep	0.70	-0.23	0.47
Grains	1.06	-0.35	0.70
Beef cattle	1.94	-0.65	1.29
Dairy cattle	1.08	-0.37	0.72
Pigs	0.27	-0.09	0.18
Poultry	0.60	-0.20	0.40
Other agriculture	3.94	-1.32	2.62
Services to agriculture, hunting and trapping	0.92	-0.30	0.61
Forestry and logging	0.50	-0.12	0.37
Commercial fishing	0.63	-0.21	0.41
Coal	1.79	-0.45	1.34
Gas	5.80	-1.24	4.55
Oil	1.47	-0.43	1.03
Iron ores	0.20	-0.05	0.16
Non-ferrous metal ores	0.31	-0.08	0.24
Other mining	0.45	-0.11	0.34
Services to mining	15.45	-3.11	12.34
Meat and meat products	4.60	-1.55	3.05
Dairy products	3.54	-1.20	2.35
Fruit and vegetable products	1.12	-0.38	0.74
Oils and fats	0.44	-0.15	0.29
Flour mill products and cereal foods	1.83	-0.62	1.22
Bakery products	1.51	-0.51	1.00
Confectionery	1.15	-0.39	0.76
Other food products	2.69	-0.90	1.79
Soft drinks, cordials and syrups	1.48	-0.50	0.98
Beer and malt	1.26	-0.42	0.84
Wine, spirits and tobacco products (a)	1.44	-0.48	0.96
Textile fibres, yarns and woven fabrics	0.12	-0.04	0.08
Textile products	0.37	-0.12	0.25
Knitting mill products	0.26	-0.09	0.17

Table A.14 East Coast LNG expansion: Gross output formation by industry ($2009m) – continued

	Case study: 50 PJ of natural gas allocated to LNG exports – base case prices	Case study: 50 PJ of natural gas allocated to LNG exports – 20% reduction in base case prices	Net benefit of 50 PJ of LNG exports with 20% reduction in base case prices
Clothing	0.57	-0.18	0.39
Footwear	0.12	-0.04	0.08
Leather and leather products	0.09	-0.03	0.07
Sawmill products	0.54	-0.14	0.40
Other wood products	1.09	-0.28	0.81
Pulp, paper and paperboard	0.30	-0.09	0.21
Paper containers and products	0.90	-0.29	0.61
Printing and services to printing	2.88	-0.86	2.02
Publishing, recorded media, etc.	3.29	-1.05	2.24
Petroleum and coal products	6.35	-1.87	4.48
Glass and glass products	0.67	-0.20	0.47
Ceramic products	0.12	-0.03	0.08
Cement, lime and concrete slurry	0.83	-0.20	0.63
Plaster and other concrete products	0.43	-0.10	0.33
Other non-metallic mineral products	0.23	-0.05	0.17
Iron and steel	4.24	-1.00	3.24
Structural metal products	2.92	-0.66	2.26
Sheet metal products	0.91	-0.25	0.66
Fabricated metal products	2.23	-0.53	1.70
Motor vehicles and parts, other transport equipment	4.75	-1.48	3.27
Ships and boats	0.40	-0.12	0.28
Railway equipment	1.21	-0.27	0.95
Aircraft	1.39	-0.34	1.05
Photographic and scientific equipment	0.91	-0.28	0.64
Electronic equipment	0.83	-0.23	0.59
Household appliances	1.37	-0.43	0.94
Other electrical equipment	1.34	-0.36	0.98
Agricultural, mining, etc. machinery	1.79	-0.40	1.39
Other machinery and equipment	1.60	-0.38	1.22
Prefabricated buildings	0.85	-0.17	0.68
Furniture	1.26	-0.40	0.86
Other manufacturing	1.07	-0.30	0.76
Electricity supply	10.97	-3.21	7.76
Gas supply	1.10	-0.34	0.76
Water supply, sewerage and drainage services	4.06	-1.26	2.80
Residential building	1.94	-0.47	1.46
Other construction	3.52	-0.84	2.68
Construction trade services	19.47	-4.56	14.91
Wholesale trade	25.88	-7.38	18.50
Wholesale mechanical repairs	2.89	-0.61	2.28
Other wholesale repairs	5.51	-1.29	4.22
Retail trade	32.74	-10.99	21.75

Table A.14 East Coast LNG expansion: Gross output formation by industry ($2009m) – continued			
	Case study: 50 PJ of natural gas allocated to LNG exports – base case prices	**Case study: 50 PJ of natural gas allocated to LNG exports – 20% reduction in base case prices**	**Net benefit of 50 PJ of LNG exports with 20% reduction in base case prices**
Retail mechanical repairs	7.63	-2.15	5.48
Other retail repairs	0.44	-0.14	0.30
Accommodation, cafes and restaurants	16.97	-5.60	11.37
Road transport	9.58	-2.87	6.72
Rail, pipeline and other transport	10.02	-2.21	7.80
Water transport	1.13	-0.28	0.85
Air and space transport	4.99	-1.58	3.41
Services to transport, storage	13.62	-3.43	10.19
Communication services	15.22	-4.65	10.57
Finance	47.38	-14.02	33.36
Ownership of dwellings	4.72	-1.62	3.10
Other property services	31.27	-7.86	23.41
Scientific research, technical and computer services	11.85	-2.96	8.89
Legal, accounting, marketing and business management services	18.85	-5.24	13.61
Other business services	11.10	-3.10	8.01
Government administration	2.21	-0.61	1.60
Defence	0.03	-0.01	0.02
Education	9.51	-3.13	6.38
Health services	9.29	-3.18	6.11
Community services	1.16	-0.40	0.76
Motion picture, radio and television services	4.08	-1.24	2.85
Libraries, museums and the arts	1.11	-0.34	0.76
Sport, gambling and recreational services	7.78	-2.45	5.34
Personal services	3.71	-1.27	2.45
Other services	3.99	-1.36	2.63
Total	**1082.81**	**-256.45**	**-28757.76**

Table A.15 East Coast LNG expansion: Total employment formation (ths)			
	Case study: 50 PJ of natural gas allocated to LNG exports – base case prices	Case study: 50 PJ of natural gas allocated to LNG exports – 20% reduction in base case prices	Net benefit of 50 PJ of LNG exports with 20% reduction in base case prices
Constrained industries			
Basic chemicals	0.00	0.00	0.00
Paints	0.00	0.00	0.00
Medicinal and pharmaceutical products, pesticides	0.00	0.00	0.00
Soap and detergents	0.00	0.00	0.00
Cosmetics and toiletry preparations	0.00	0.00	0.00
Other chemical products	0.00	0.00	0.00
Rubber products	0.00	0.00	0.00
Plastic products	0.00	0.00	0.00
Basic non-ferrous metal and products	0.00	0.00	0.00
LNG	0.12	-0.02	0.09
Unconstrained industries			
Sheep	0.01	0.00	0.01
Grains	0.01	0.00	0.01
Beef cattle	0.03	-0.01	0.02
Dairy cattle	0.01	0.00	0.01
Pigs	0.01	0.00	0.00
Poultry	0.01	0.00	0.00
Other agriculture	0.04	-0.01	0.02
Services to agriculture, hunting and trapping	0.01	0.00	0.00
Forestry and logging	0.00	0.00	0.00
Commercial fishing	0.00	0.00	0.00
Coal	0.00	0.00	0.00
Gas	0.00	0.00	0.00
Oil	0.00	0.00	0.00
Iron ores	0.00	0.00	0.00
Non-ferrous metal ores	0.00	0.00	0.00
Other mining	0.00	0.00	0.00
Services to mining	0.10	-0.02	0.08
Meat and meat products	0.07	-0.02	0.04
Dairy products	0.04	-0.01	0.02
Fruit and vegetable products	0.01	0.00	0.00
Oils and fats	0.00	0.00	0.00
Flour mill products and cereal foods	0.01	0.00	0.01
Bakery products	0.03	-0.01	0.02
Confectionery	0.01	0.00	0.01
Other food products	0.02	-0.01	0.01
Soft drinks, cordials and syrups	0.01	0.00	0.00
Beer and malt	0.00	0.00	0.00
Wine, spirits and tobacco products (a)	0.01	0.00	0.00
Textile fibres, yarns and woven fabrics	0.00	0.00	0.00
Textile products	0.01	0.00	0.00
Knitting mill products	0.00	0.00	0.00

Table A.15 East Coast LNG expansion: Total employment formation (ths) – continued

	Case study: 50 PJ of natural gas allocated to LNG exports – base case prices	Case study: 50 PJ of natural gas allocated to LNG exports – 20% reduction in base case prices	Net benefit of 50 PJ of LNG exports with 20% reduction in base case prices
Clothing	0.01	0.00	0.01
Footwear	0.00	0.00	0.00
Leather and leather products	0.00	0.00	0.00
Sawmill products	0.00	0.00	0.00
Other wood products	0.02	0.00	0.01
Pulp, paper and paperboard	0.00	0.00	0.00
Paper containers and products	0.01	0.00	0.00
Printing and services to printing	0.03	-0.01	0.02
Publishing, recorded media, etc.	0.03	-0.01	0.02
Petroleum and coal products	0.01	0.00	0.01
Glass and glass products	0.01	0.00	0.00
Ceramic products	0.00	0.00	0.00
Cement, lime and concrete slurry	0.00	0.00	0.00
Plaster and other concrete products	0.00	0.00	0.00
Other non-metallic mineral products	0.00	0.00	0.00
Iron and steel	0.04	-0.01	0.03
Structural metal products	0.02	0.00	0.01
Sheet metal products	0.00	0.00	0.00
Fabricated metal products	0.02	-0.01	0.02
Motor vehicles and parts, other transport equipment	0.05	-0.02	0.04
Ships and boats	0.00	0.00	0.00
Railway equipment	0.00	0.00	0.00
Aircraft	0.01	0.00	0.00
Photographic and scientific equipment	0.01	0.00	0.01
Electronic equipment	0.01	0.00	0.01
Household appliances	0.01	0.00	0.01
Other electrical equipment	0.01	0.00	0.01
Agricultural, mining, etc. machinery	0.02	0.00	0.02
Other machinery and equipment	0.02	0.00	0.01
Prefabricated buildings	0.01	0.00	0.01
Furniture	0.03	-0.01	0.02
Other manufacturing	0.01	0.00	0.01
Electricity supply	0.03	-0.01	0.02
Gas supply	0.01	0.00	0.01
Water supply, sewerage and drainage services	0.02	-0.01	0.01
Residential building	0.01	0.00	0.01
Other construction	0.02	-0.01	0.02
Construction trade services	0.29	-0.07	0.22
Wholesale trade	0.19	-0.05	0.14
Wholesale mechanical repairs	0.02	0.00	0.02
Other wholesale repairs	0.05	-0.01	0.04
Retail trade	0.56	-0.19	0.37

Table A.15 East Coast LNG expansion: Total employment formation (ths) – continued

	Case study: 50 PJ of natural gas allocated to LNG exports – base case prices	Case study: 50 PJ of natural gas allocated to LNG exports – 20% reduction in base case prices	Net benefit of 50 PJ of LNG exports with 20% reduction in base case prices
Retail mechanical repairs	0.20	-0.06	0.14
Other retail repairs	0.01	0.00	0.01
Accommodation, cafes and restaurants	0.25	-0.08	0.17
Road transport	0.10	-0.03	0.07
Rail, pipeline and other transport	0.08	-0.02	0.06
Water transport	0.01	0.00	0.00
Air and space transport	0.04	-0.01	0.02
Services to transport, storage	0.07	-0.02	0.05
Communication services	0.09	-0.03	0.07
Finance	0.19	-0.06	0.14
Ownership of dwellings	0.00	0.00	0.00
Other property services	0.11	-0.03	0.08
Scientific research, technical and computer services	0.13	-0.03	0.10
Legal, accounting, marketing and business management services	0.17	-0.05	0.12
Other business services	0.08	-0.02	0.06
Government administration	0.03	-0.01	0.02
Defence	0.00	0.00	0.00
Education	0.12	-0.04	0.08
Health services	0.11	-0.04	0.07
Community services	0.02	-0.01	0.01
Motion picture, radio and television services	0.03	-0.01	0.02
Libraries, museums and the arts	0.02	-0.01	0.02
Sport, gambling and recreational services	0.11	-0.04	0.08
Personal services	0.10	-0.03	0.06
Other services	0.05	-0.02	0.03
Total	**4.28**	**-1.25**	**3.03**

Appendix B: Input-output flow table with direct allocation of imports – Australia

Table B.1(a) Australia input-output flow table with direct allocation of imports – $2009m

	Sheep	Grains	Beef cattle	Dairy cattle	Pigs	Poultry	Other agriculture	Services to agriculture, hunting and trapping	Forestry and logging	Commercial fishing
Sheep	2.82	2.66	4.46	1.74	1.64	2.28	2.14	1.15	0.00	0.00
Grains	46.57	1725.26	95.11	50.94	15.51	35.12	29.84	2.74	0.03	0.02
Beef cattle	0.00	0.00	11.30	2.89	0.00	0.00	0.00	0.00	0.00	0.00
Dairy cattle	0.00	0.00	1.19	1.14	0.00	0.00	0.00	0.00	0.00	0.00
Pigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Poultry	0.00	0.00	0.00	0.00	0.00	13.34	0.00	0.00	0.00	0.00
Other agriculture	161.23	0.34	527.58	122.40	23.88	0.28	359.74	1194.95	4.39	0.07
Services to agriculture, hunting and trapping	555.44	612.63	1295.55	295.68	11.84	46.84	1405.10	32.09	10.57	0.00
Forestry and logging	4.17	0.08	133.48	6.99	0.02	0.07	95.67	0.00	381.55	0.00
Commercial fishing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coal	0.28	0.27	1.10	0.29	0.03	0.03	0.62	0.30	0.02	0.02
Gas	2.56	2.71	4.34	2.23	0.71	6.67	4.98	2.09	1.24	0.28
LNG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Oil	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Iron ores	0.03	0.04	0.13	0.03	0.00	0.01	0.06	0.09	0.00	0.01
Non-ferrous metal ores	1.07	0.94	4.01	1.14	0.13	0.07	2.44	0.39	0.06	0.01
Other mining	0.04	0.06	0.08	0.03	0.02	0.03	0.50	0.02	0.00	0.00
Services to mining	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Meat and meat products	1.22	0.78	10.83	16.71	2.77	12.27	11.05	8.39	0.14	4.55
Dairy products	5.76	1.32	47.85	64.06	34.55	25.38	14.81	1.41	0.26	8.64
Fruit and vegetable products	0.49	0.98	1.07	0.74	0.51	0.48	1.25	0.45	0.17	0.46
Oils and fats	1.67	0.35	7.66	6.88	8.39	5.10	4.16	0.31	0.12	1.86
Flour mill products and cereal foods	7.86	2.93	39.92	57.05	25.76	43.30	12.99	1.81	4.31	25.16
Bakery products	0.32	0.91	0.59	0.31	0.05	0.61	1.44	0.41	0.36	0.63
Confectionery	2.47	0.70	20.51	43.20	7.62	30.55	19.36	14.31	0.12	11.03
Other food products	26.80	3.52	199.02	379.30	65.82	275.07	108.87	67.11	0.45	98.05
Soft drinks, cordials and syrups	0.63	2.30	1.04	0.89	0.05	0.11	3.33	0.42	0.04	0.12
Beer and malt	0.40	1.16	0.61	0.51	0.07	0.07	0.51	0.30	0.09	0.17
Wine, spirits and tobacco products	3.90	1.30	34.84	4.61	0.71	0.55	15.33	3.88	2.74	5.34
Textile fibres, yarns and woven fabrics	0.20	0.64	0.45	0.21	0.06	0.09	1.00	0.28	0.13	0.34

Table B.1(a) Australia input-output flow table with direct allocation of imports – $2009m (continued)

	Sheep	Grains	Beef cattle	Dairy cattle	Pigs	Poultry	Other agriculture	Services to agriculture, hunting and trapping	Forestry and logging	Commercial fishing
Textile products	0.27	0.57	0.73	0.13	0.03	0.11	0.73	0.17	0.27	1.24
Knitting mill products	0.18	0.49	0.42	0.14	0.04	0.07	0.50	0.16	0.16	0.91
Clothing	0.88	2.27	1.66	1.91	0.13	0.32	2.66	0.81	0.94	1.72
Footwear	0.14	0.36	0.24	0.31	0.04	0.08	0.45	0.16	0.23	0.32
Leather and leather products	0.25	0.57	0.97	1.44	0.24	1.03	1.32	0.24	0.15	0.67
Sawmill products	0.95	0.71	0.94	0.73	0.18	0.12	0.82	0.36	0.22	0.42
Other wood products	1.08	1.61	1.77	0.75	0.47	0.73	1.95	1.13	3.42	9.37
Pulp, paper and paperboard	0.21	0.45	0.40	0.13	0.09	0.29	2.43	0.19	0.18	0.18
Paper containers and products	0.67	1.09	1.08	0.24	0.12	6.29	18.56	0.25	0.21	0.30
Printing and services to printing	1.17	3.55	12.87	0.71	0.34	0.17	10.47	1.24	0.69	0.93
Publishing, recorded media, etc.	2.18	6.47	5.55	1.67	0.20	0.33	6.84	0.78	0.81	0.87
Petroleum and coal products	91.55	138.70	61.52	43.43	3.65	17.52	193.32	8.72	33.48	82.31
Basic chemicals	93.73	263.20	226.97	66.85	4.32	4.86	557.99	63.41	2.47	3.19
Paints	1.15	2.24	4.33	0.66	0.33	0.67	3.91	1.15	0.75	3.30
Medicinal and pharmaceutical products, pesticides	30.50	38.54	81.04	25.36	3.29	6.01	80.92	20.16	6.45	0.52
Soap and detergents	0.59	1.31	0.67	0.14	0.06	0.10	1.57	1.78	0.54	0.28
Cosmetics and toiletry preparations	0.15	0.21	0.35	0.12	0.02	0.04	0.35	0.10	0.05	0.03
Other chemical products	1.95	7.03	12.74	1.73	0.91	0.39	3.21	0.90	2.89	0.85
Rubber products	0.59	2.90	0.85	0.26	0.05	0.10	7.98	0.17	0.16	0.87
Plastic products	2.10	3.07	2.21	2.09	0.27	5.51	26.56	1.32	1.01	10.00
Glass and glass products	0.86	1.28	0.83	0.18	0.03	0.11	1.04	0.25	0.37	0.65
Ceramic products	0.04	0.12	0.08	0.04	0.01	0.02	0.60	0.07	0.24	0.52
Cement, lime and concrete slurry	0.19	0.53	0.35	0.17	0.05	0.11	0.62	0.23	6.75	0.96
Plaster and other concrete products	0.20	0.39	0.37	0.15	0.09	0.14	0.44	0.16	4.24	0.84
Other non-metallic mineral products	0.20	0.72	0.28	0.09	0.02	0.02	2.26	0.09	2.49	1.25
Iron and steel	0.76	1.92	2.51	1.10	0.21	0.46	35.39	0.68	2.21	4.07
Basic non-ferrous metal and products	1.40	3.34	2.60	1.13	0.38	0.94	6.49	1.35	0.95	2.55
Structural metal products	1.39	3.70	4.32	1.92	0.55	2.12	36.34	1.28	6.03	13.18
Sheet metal products	0.71	2.25	1.10	1.35	0.12	0.51	8.94	0.25	0.80	3.05
Fabricated metal products	11.57	9.52	7.27	1.48	0.49	1.62	26.11	0.86	9.47	18.76
Motor vehicles and parts, other transport equipment	3.43	7.64	5.95	2.28	1.34	1.86	7.00	1.97	4.09	10.82
Ships and boats	0.21	0.37	0.40	0.16	0.08	0.14	0.32	0.68	0.35	27.97
Railway equipment	0.10	0.21	0.20	0.09	0.03	0.06	0.20	0.08	0.12	0.29

Table B.1(a) Australia input-output flow table with direct allocation of imports – $2009m (continued)

	Sheep	Grains	Beef cattle	Dairy cattle	Pigs	Poultry	Other agriculture	Services to agriculture, hunting and trapping	Forestry and logging	Commercial fishing
Aircraft	0.50	1.63	1.08	0.19	0.03	0.02	0.92	5.86	0.22	0.21
Photographic and scientific equipment	1.38	1.40	3.96	2.47	0.16	0.27	2.74	0.67	0.60	2.83
Electronic equipment	0.93	4.53	2.31	1.29	0.23	0.51	1.84	0.61	1.68	4.20
Household appliances	0.51	1.52	2.49	1.11	0.13	0.23	2.09	0.60	0.58	2.31
Other electrical equipment	1.17	2.31	4.21	1.72	0.44	0.69	4.74	1.07	4.97	9.83
Agricultural, mining, etc. machinery	5.53	44.16	14.67	3.79	0.74	2.85	12.72	1.89	9.33	13.23
Other machinery and equipment	2.04	6.54	4.21	2.07	0.42	0.79	26.54	1.35	11.87	20.01
Prefabricated buildings	0.07	0.21	0.16	0.07	0.01	0.04	0.31	0.09	0.20	0.16
Furniture	0.63	1.41	0.92	0.45	0.11	0.26	2.83	0.70	0.94	3.28
Other manufacturing	2.08	4.30	5.27	6.29	1.12	4.10	11.63	0.90	1.32	6.63
Electricity supply	10.55	21.13	49.89	28.06	4.27	13.19	36.49	3.04	1.14	4.92
Gas supply	1.89	2.12	2.43	1.37	0.65	0.83	2.76	1.46	0.07	0.24
Water supply, sewerage and drainage services	14.08	218.43	132.27	87.66	22.22	24.67	160.91	4.23	0.74	2.34
Residential building	3.14	5.66	12.95	2.90	0.98	1.80	6.26	7.46	0.92	0.78
Other construction	9.67	15.68	34.82	9.65	2.05	4.11	14.92	10.50	1.71	1.06
Construction trade services	70.44	73.77	130.75	41.79	35.60	58.35	60.89	23.77	10.08	10.21
Wholesale trade	244.23	673.79	345.56	163.55	28.07	68.28	658.64	206.46	118.43	193.82
Wholesale mechanical repairs	14.22	47.95	22.30	11.29	1.57	1.78	19.10	0.22	24.73	6.42
Other wholesale repairs	4.70	33.98	15.64	4.75	0.33	2.18	12.51	1.01	2.37	17.89
Retail trade	15.84	42.37	27.49	9.11	1.79	4.53	51.27	14.81	12.29	15.43
Retail mechanical repairs	56.64	54.78	85.84	28.03	1.99	7.60	82.55	3.38	61.81	41.48
Other retail repairs	2.24	1.15	4.09	1.34	1.22	1.87	1.67	0.71	0.00	0.00
Accommodation, cafes and restaurants	19.05	36.23	30.64	12.01	0.21	1.20	38.72	0.82	1.95	6.89
Road transport	119.31	418.02	299.53	173.54	28.86	74.05	280.38	64.63	23.19	36.93
Rail, pipeline and other transport	4.88	18.24	5.65	2.37	0.80	1.44	4.40	1.92	0.30	0.28
Water transport	0.38	0.61	0.08	0.02	0.02	0.02	0.44	0.04	0.13	6.35
Air and space transport	4.38	4.54	11.79	3.01	0.49	0.54	9.35	6.36	0.65	1.46
Services to transport, storage	28.65	233.79	52.43	12.99	2.77	43.73	38.93	0.55	2.37	12.67
Communication services	45.20	45.85	93.11	20.87	5.61	9.36	46.04	4.14	3.88	6.87
Finance	117.26	344.08	258.25	93.21	15.26	43.71	345.73	56.95	39.53	79.69
Ownership of dwellings	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other property services	41.04	100.35	104.40	21.11	4.63	10.92	61.60	96.31	3.89	4.68
Scientific research, technical and computer services	21.93	68.65	109.25	6.27	2.01	2.08	114.97	8.49	0.39	0.84

Table B.1(a) Australia input-output flow table with direct allocation of imports – $2009m (continued)

	Sheep	Grains	Beef cattle	Dairy cattle	Pigs	Poultry	Other agriculture	Services to agriculture, hunting and trapping	Forestry and logging	Commercial fishing
Legal, accounting, marketing and business management services	99.12	160.64	212.32	40.35	29.62	28.86	104.69	15.28	1.72	9.14
Other business services	4.14	10.81	41.27	0.04	0.01	0.50	5.69	0.38	1.80	2.88
Government administration	3.75	5.03	3.55	0.41	0.06	0.20	9.21	0.73	1.25	3.69
Defence	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Education	0.40	2.58	2.79	0.53	0.11	0.70	4.09	0.83	0.28	1.90
Health services	1.65	0.01	21.78	8.45	0.61	2.68	0.97	2.43	0.16	1.01
Community services	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Motion picture, radio and television services	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.55	0.86	0.00
Libraries, museums and the arts	0.57	0.80	12.64	0.07	0.01	0.02	0.31	0.08	7.27	0.12
Sport, gambling and recreational services	14.31	0.09	14.59	7.06	0.86	0.01	0.12	0.01	0.01	0.02
Personal services	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	1.97
Other services	0.06	0.36	0.35	0.02	0.00	0.05	0.12	0.01	0.00	0.00
Total intermediate usage including imports	**2342**	**5978**	**5544**	**2265**	**450**	**1040**	**6109**	**2085**	**1024**	**1250**
Wages and salaries	541	466	914	439	131	163	2168	843	657	326
Gross surplus	1968	3614	4137	1699	390	847	5741	2200	517	560
Indirect taxes on production	185	393	267	179	29	50	407	117	63	114
Total gross output	**5035**	**10451**	**10861**	**4582**	**1000**	**2101**	**14424**	**5244**	**2262**	**2250**
Value added at factor cost to output ratio	0.53	0.43	0.49	0.51	0.55	0.50	0.58	0.60	0.55	0.44
Share of wages and mixed income in value added	0.81	0.76	0.82	0.82	0.84	0.80	0.79	0.77	0.80	0.68
Employment to gross output ratio	16.64	8.63	14.25	13.27	23.95	9.01	9.46	7.25	7.13	6.58
Foreign ownership ratio	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Direct tax rate on surplus	0.01	0.01	0.01	0.01	0.08	0.09	0.02	0.06	0.06	0.06
Indirect tax rate on production	0.06	0.08	0.04	0.07	0.04	0.04	0.04	0.03	0.04	0.11
Foreign income payout ratio	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Replacement depreciation to value added ratio	0.08	0.07	0.18	0.05	0.12	0.13	0.08	0.06	0.13	0.13
Net national product ratio	0.91	0.92	0.81	0.94	0.87	0.86	0.91	0.93	0.86	0.86
Domestic income distribution ratio	0.17	0.20	0.16	0.16	0.14	0.17	0.19	0.20	0.16	0.25

Table B.1(b) Australia input-output flow table with direct allocation of imports – $2009m (continued)

	Coal	Gas	LNG	Oil	Iron ores	Non-ferrous metal ores	Other mining	Services to mining	Meat and meat products	Dairy products
Sheep	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1575.79	0.00
Grains	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Beef cattle	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7479.29	0.00
Dairy cattle	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4062.56
Pigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	651.23	0.00
Poultry	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1165.84	0.00
Other agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	16.01
Services to agriculture, hunting and trapping	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Forestry and logging	41.01	7.77	2.99	7.53	0.11	60.12	1.00	0.00	0.00	0.00
Commercial fishing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coal	150.92	30.29	11.64	29.36	9.67	19.88	0.52	0.07	0.89	0.79
Gas	12.69	215.70	77.95	49.97	35.18	19.79	1.67	2.00	37.95	58.04
LNG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Oil	0.00	0.00	0.00	299.82	0.00	0.00	0.00	0.00	0.00	0.00
Iron ores	1.35	0.30	0.12	0.29	804.22	0.74	0.14	0.08	0.15	0.03
Non-ferrous metal ores	16.35	3.22	1.24	3.12	55.08	1108.46	5.87	16.40	0.43	0.08
Other mining	31.61	1.99	0.77	1.93	4.23	6.85	687.19	0.03	0.07	0.01
Services to mining	3243.55	622.23	239.13	603.08	4941.65	4236.04	38.20	147.94	0.00	0.00
Meat and meat products	2.44	0.42	0.16	0.41	1.57	1.97	0.12	0.64	1320.25	13.31
Dairy products	1.81	0.30	0.11	0.29	16.44	1.46	0.10	0.59	13.06	1983.16
Fruit and vegetable products	3.05	0.46	0.18	0.45	1.77	2.79	0.18	0.97	15.34	23.80
Oils and fats	1.20	0.18	0.07	0.18	0.61	1.11	0.06	0.42	3.03	11.30
Flour mill products and cereal foods	2.67	0.43	0.16	0.42	1.66	2.32	0.14	0.73	24.60	25.99
Bakery products	11.19	0.98	0.38	0.95	9.70	7.78	0.55	9.58	17.24	69.52
Confectionery	1.91	0.31	0.12	0.30	1.09	1.67	0.10	0.49	2.43	162.09
Other food products	8.22	1.43	0.55	1.39	8.55	6.93	0.61	2.34	62.32	154.13
Soft drinks, cordials and syrups	0.81	0.17	0.07	0.16	1.46	0.62	0.07	0.14	5.16	9.04
Beer and malt	3.35	0.77	0.30	0.75	6.29	7.01	0.20	0.89	0.75	4.96
Wine, spirits and tobacco products	6.11	2.67	1.03	2.59	6.92	6.10	0.43	1.20	20.50	2.34
Textile fibres, yarns and woven fabrics	3.00	0.45	0.17	0.44	3.36	2.35	0.16	1.02	0.59	2.59
Textile products	4.23	1.05	0.40	1.02	3.09	3.38	0.09	0.74	1.10	7.38
Knitting mill products	1.94	0.40	0.15	0.39	2.73	1.50	0.14	0.29	0.37	0.97
Clothing	12.11	2.01	0.77	1.95	5.19	10.11	0.47	1.35	2.67	6.60

Table B.1(b) Australia input-output flow table with direct allocation of imports – $2009m (continued)

	Coal	Gas	LNG	Oil	Iron ores	Non-ferrous metal ores	Other mining	Services to mining	Meat and meat products	Dairy products
Footwear	1.59	0.30	0.12	0.29	1.22	1.31	0.10	0.23	0.51	1.32
Leather and leather products	1.68	0.30	0.11	0.29	1.09	1.49	0.10	0.37	3.18	1.36
Sawmill products	7.21	1.20	0.46	1.16	3.24	3.17	0.15	0.70	0.79	1.60
Other wood products	45.06	9.02	3.47	8.74	38.76	30.52	1.83	4.59	1.76	9.42
Pulp, paper and paperboard	4.62	0.84	0.32	0.82	2.14	3.26	0.13	18.01	15.65	37.75
Paper containers and products	7.43	1.75	0.67	1.70	5.51	5.01	0.31	3.10	97.82	201.03
Printing and services to printing	42.11	10.63	4.09	10.31	16.72	26.74	2.34	24.95	11.38	34.98
Publishing, recorded media, etc.	17.68	5.35	2.06	5.19	6.92	13.45	0.52	9.91	3.64	11.51
Petroleum and coal products	537.32	47.85	18.39	46.38	293.63	524.75	25.50	159.67	13.20	62.35
Basic chemicals	116.48	20.45	7.86	19.82	57.52	140.73	4.45	17.00	8.64	44.15
Paints	7.93	1.46	0.56	1.41	5.00	6.73	0.23	1.05	0.30	1.14
Medicinal and pharmaceutical products, pesticides	13.72	3.09	1.19	2.99	6.13	12.85	0.45	3.45	2.67	6.70
Soap and detergents	5.00	0.64	0.24	0.62	3.72	6.47	0.20	1.37	3.41	11.10
Cosmetics and toiletry preparations	0.59	0.16	0.06	0.15	1.13	0.39	0.05	0.10	0.16	0.45
Other chemical products	259.85	43.36	16.67	42.03	144.63	142.80	10.53	3.50	0.96	4.31
Rubber products	36.17	6.30	2.42	6.10	7.49	29.41	1.01	2.19	0.18	0.46
Plastic products	33.95	6.02	2.31	5.84	16.80	32.65	1.16	10.20	23.31	503.84
Glass and glass products	17.17	2.26	0.87	2.20	13.10	13.08	0.50	4.56	0.43	0.68
Ceramic products	2.14	0.25	0.10	0.24	1.46	4.15	0.15	1.65	0.18	1.47
Cement, lime and concrete slurry	15.39	3.13	1.20	3.04	14.24	31.92	0.80	20.99	0.56	1.62
Plaster and other concrete products	15.00	1.98	0.76	1.92	14.91	18.14	0.28	2.72	0.26	1.13
Other non-metallic mineral products	13.54	4.02	1.54	3.89	15.59	8.21	0.63	4.59	0.17	0.95
Iron and steel	289.72	47.23	18.15	45.77	182.16	156.23	5.20	257.88	1.57	5.78
Basic non-ferrous metal and products	66.79	24.27	9.33	23.53	86.94	78.09	4.24	25.55	3.11	27.85
Structural metal products	223.84	45.85	17.62	44.44	217.37	259.69	8.55	175.22	1.29	3.41
Sheet metal products	48.38	8.77	3.37	8.50	24.99	56.76	1.06	17.95	2.75	134.96
Fabricated metal products	224.89	46.10	17.72	44.68	108.22	159.01	7.40	34.13	5.09	8.81
Motor vehicles and parts, other transport equipment	75.23	16.94	6.51	16.42	47.72	57.85	5.26	18.40	3.39	9.02
Ships and boats	10.01	1.89	0.73	1.83	9.32	6.03	0.38	1.93	1.58	1.00
Railway equipment	13.92	4.83	1.85	4.68	4.55	2.23	0.26	0.26	0.20	0.39
Aircraft	147.12	27.85	10.70	26.99	15.03	8.71	2.38	16.06	0.10	0.69
Photographic and scientific equipment	26.28	5.97	2.29	5.78	14.45	18.45	0.86	3.19	1.28	7.04
Electronic equipment	11.94	5.30	2.04	5.14	16.43	10.19	0.61	8.83	1.41	7.74

Table B.1(b) Australia input-output flow table with direct allocation of imports – $2009m (continued)

	Coal	Gas	LNG	Oil	Iron ores	Non-ferrous metal ores	Other mining	Services to mining	Meat and meat products	Dairy products
Household appliances	17.61	5.55	2.13	5.38	7.82	13.58	1.12	4.44	0.81	4.37
Other electrical equipment	58.14	11.45	4.40	11.10	34.89	38.15	3.04	5.61	3.63	21.19
Agricultural, mining, etc. machinery	287.42	51.61	19.84	50.03	118.37	259.25	18.44	11.49	1.56	7.78
Other machinery and equipment	215.63	34.76	13.36	33.69	95.87	196.27	10.31	26.31	8.81	16.57
Prefabricated buildings	132.33	32.96	12.67	31.95	82.80	92.89	8.32	2.66	0.24	0.53
Furniture	21.86	4.28	1.64	4.15	16.11	18.75	0.97	4.09	1.60	5.18
Other manufacturing	38.29	8.53	3.28	8.27	39.40	39.55	1.94	11.30	9.26	29.74
Electricity supply	410.33	79.29	30.47	76.85	224.80	481.93	2.50	4.01	130.75	193.52
Gas supply	6.83	1.50	0.58	1.46	19.79	14.87	0.35	0.03	2.32	4.22
Water supply, sewerage and drainage services	70.33	8.70	3.34	8.43	275.95	179.62	13.38	1.85	28.91	32.02
Residential building	99.82	24.67	9.48	23.91	211.46	77.86	18.28	44.79	4.57	3.00
Other construction	274.01	59.39	22.82	57.56	842.41	194.27	85.23	60.64	6.18	4.05
Construction trade services	1221.53	304.97	117.20	295.59	5167.95	1003.91	192.47	326.54	15.09	49.52
Wholesale trade	1677.97	237.85	91.41	230.53	925.22	1582.16	88.21	468.73	383.49	1162.12
Wholesale mechanical repairs	176.85	95.04	36.53	92.12	138.95	67.05	9.24	246.94	9.08	6.96
Other wholesale repairs	454.67	140.62	54.04	136.29	138.12	100.77	15.69	157.33	25.01	8.61
Retail trade	171.55	30.07	11.56	29.14	107.04	107.94	9.37	45.46	212.50	128.82
Retail mechanical repairs	175.58	86.96	33.42	84.28	103.17	146.53	34.47	113.23	18.62	14.28
Other retail repairs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Accommodation, cafes and restaurants	124.71	33.37	12.83	32.35	89.35	64.64	7.67	113.50	3.50	2.61
Road transport	405.57	65.09	25.02	63.09	152.81	281.41	49.11	92.31	1064.24	483.67
Rail, pipeline and other transport	1926.32	342.66	131.69	332.12	119.70	55.36	0.52	3.80	11.79	15.80
Water transport	45.69	10.00	3.84	9.69	8.07	21.98	1.75	359.92	1.05	3.44
Air and space transport	93.25	17.14	6.59	16.61	86.89	72.95	4.55	89.98	2.22	1.99
Services to transport, storage	1169.62	225.91	86.82	218.96	231.79	173.66	8.91	98.91	93.79	164.35
Communication services	191.90	49.15	18.89	47.64	74.33	367.76	13.30	127.98	44.48	101.62
Finance	1141.70	295.41	113.53	286.32	723.89	952.44	176.74	327.21	80.25	81.10
Ownership of dwellings	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other property services	1721.27	407.16	156.47	394.63	1083.64	533.21	30.22	72.19	338.34	54.20
Scientific research, technical and computer services	165.77	17.00	6.53	16.47	55.03	229.07	3.40	3668.41	39.03	69.18
Legal, accounting, marketing and business management services	1028.24	120.96	46.49	117.24	302.53	844.39	15.18	312.48	41.33	208.89
Other business services	334.76	36.58	14.06	35.45	106.82	545.69	10.51	314.49	128.55	96.96

Table B.1(b) Australia input-output flow table with direct allocation of imports – $2009m (continued)

	Coal	Gas	LNG	Oil	Iron ores	Non-ferrous metal ores	Other mining	Services to mining	Meat and meat products	Dairy products
Government administration	121.14	24.00	9.22	23.26	175.98	98.03	6.49	13.19	9.75	3.59
Defence	0.11	0.02	0.01	0.02	0.11	0.08	0.00	1.30	0.14	0.13
Education	67.21	18.04	6.93	17.48	33.97	47.21	4.40	34.85	14.91	34.45
Health services	0.03	0.00	0.00	0.00	0.03	0.02	0.00	1.51	29.60	0.11
Community services	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Motion picture, radio and television services	5.68	2.29	0.88	2.22	20.81	54.46	0.55	18.65	7.15	48.76
Libraries, museums and the arts	0.00	0.00	0.00	0.00	0.05	1.38	0.03	49.17	0.00	0.00
Sport, gambling and recreational services	75.46	52.34	20.11	50.73	8.84	39.30	0.03	94.28	0.00	0.00
Personal services	0.23	0.00	0.00	0.00	0.00	0.00	0.00	6.79	0.00	0.00
Other services	44.27	0.00	0.00	0.00	10.11	11.83	0.11	0.00	3.36	0.38
Total intermediate usage including imports	**23076**	**4822**	**1848**	**4815**	**20960**	**19037**	**1820**	**9326**	**15582**	**11555**
Wages and salaries	4373	1486	211	1225	967	3249	769	5376	3644	1384
Gross surplus	29574	3761	7998	8488	11711	16205	1574	511	134	108
Indirect taxes on production	9	74	28	74	513	599	37	293	451	282
Total gross output	**57032**	**10143**	**10086**	**14601**	**34152**	**39091**	**4200**	**15506**	**19811**	**13329**
Value added at factor cost to output ratio	0.60	0.52	0.82	0.67	0.39	0.51	0.57	0.40	0.21	0.13
Share of wages and mixed income in value added	0.13	0.31	0.05	0.14	0.08	0.17	0.37	0.93	0.92	0.85
Employment to gross output ratio	1.29	0.82	0.19	0.47	0.95	2.10	3.71	6.67	14.71	10.59
Foreign ownership ratio	0.50	0.80	0.70	0.80	0.55	0.60	0.30	0.40	0.45	0.55
Direct tax rate on surplus	0.18	0.21	0.30	0.21	0.25	0.23	0.26	0.22	0.58	0.16
Indirect tax rate on production	-0.01	0.00	0.00	0.00	0.02	0.02	0.01	0.03	0.07	0.09
Foreign income payout ratio	0.36	0.46	0.46	0.50	0.35	0.36	0.15	0.03	0.03	0.07
Replacement depreciation to value added ratio	0.13	0.30	0.24	0.30	0.11	0.26	0.17	0.15	0.13	0.23
Net national product ratio	0.51	0.24	0.29	0.21	0.54	0.38	0.68	0.83	0.84	0.70
Domestic income distribution ratio	0.36	0.11	0.15	0.14	0.28	0.24	0.34	0.04	0.04	0.05

Table B.1(c) Australia input-output flow table with direct allocation of imports – $2009m (continued)

	Fruit and vegetable products	Oils and fats	Flour mill products and cereal foods	Bakery products	Confectionery	Other food products	Soft drinks, cordials and syrups	Beer and malt	Wine, spirits and tobacco products	Textile fibres, yarns and woven fabrics
Sheep	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	418.17
Grains	12.80	153.60	1693.59	4.85	13.04	598.87	10.87	522.89	74.14	0.00
Beef cattle	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dairy cattle	0.00	0.00	0.00	0.00	0.22	0.00	0.00	0.00	0.00	0.00
Pigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Poultry	0.00	0.00	0.00	12.44	0.00	3.63	0.00	0.00	0.00	0.00
Other agriculture	573.50	22.99	3.66	40.84	49.84	1567.91	214.38	6.88	583.85	0.01
Services to agriculture, hunting and trapping	0.00	7.13	0.00	0.00	0.00	3.20	0.00	0.00	0.00	21.06
Forestry and logging	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Commercial fishing	0.00	25.76	0.63	1.58	0.30	356.64	0.00	0.00	0.00	0.00
Coal	3.55	0.67	4.31	0.56	0.92	8.32	0.04	0.49	0.14	0.38
Gas	21.46	7.47	19.29	15.73	5.25	57.53	26.17	10.15	2.78	0.03
LNG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Oil	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Iron ores	0.00	0.00	0.02	0.00	0.00	0.02	0.01	0.00	0.00	0.00
Non-ferrous metal ores	0.01	0.00	0.05	0.01	0.01	0.07	0.02	0.01	0.01	0.00
Other mining	0.01	0.46	0.03	0.29	0.04	169.98	0.00	0.00	0.00	0.00
Services to mining	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Meat and meat products	34.85	70.59	7.46	362.52	5.93	446.80	0.34	0.92	1.07	0.07
Dairy products	34.16	33.63	132.74	235.56	598.75	170.25	7.65	0.27	4.42	0.03
Fruit and vegetable products	128.50	3.73	27.11	35.38	19.77	38.17	1.51	0.78	7.84	0.04
Oils and fats	6.94	82.49	31.14	31.27	7.98	53.45	0.66	0.14	2.59	0.02
Flour mill products and cereal foods	133.22	19.05	1009.40	526.35	110.04	150.15	2.33	2.18	5.51	0.05
Bakery products	3.88	0.51	6.94	59.80	122.06	103.56	0.39	0.24	1.42	0.04
Confectionery	15.34	2.03	90.71	66.75	99.57	75.05	0.55	0.74	1.82	0.04
Other food products	90.65	71.26	166.24	178.23	183.51	570.49	53.45	13.58	26.97	0.15
Soft drinks, cordials and syrups	33.79	3.48	16.07	11.31	25.99	21.26	1.18	2.96	133.27	0.01
Beer and malt	1.82	0.19	2.86	1.78	3.93	15.37	9.99	234.75	6.81	0.01
Wine, spirits and tobacco products	3.23	1.31	4.26	1.79	79.11	6.21	1.61	1.32	244.34	0.07
Textile fibres, yarns and woven fabrics	0.28	0.52	0.63	1.20	0.36	3.79	0.21	0.15	0.45	4.32
Textile products	0.59	0.36	1.38	0.83	1.41	3.50	0.60	1.29	0.84	2.29
Knitting mill products	0.20	0.11	0.43	0.20	0.13	0.72	0.14	0.11	0.14	3.06
Clothing	1.14	0.80	2.01	1.83	1.09	5.33	0.83	0.68	0.85	0.13

Table B.1(c) Australia input-output flow table with direct allocation of imports – $2009m (continued)

	Fruit and vegetable products	Oils and fats	Flour mill products and cereal foods	Bakery products	Confectionery	Other food products	Soft drinks, cordials and syrups	Beer and malt	Wine, spirits and tobacco products	Textile fibres, yarns and woven fabrics
Footwear	0.25	0.14	0.46	0.21	0.29	0.77	0.21	0.16	0.19	0.03
Leather and leather products	0.23	0.16	0.26	0.70	0.24	1.67	0.18	0.18	0.18	0.15
Sawmill products	0.38	0.16	0.63	0.26	0.33	1.00	0.28	0.25	0.40	0.04
Other wood products	2.33	1.05	1.34	0.54	0.58	2.09	4.72	1.17	1.36	0.11
Pulp, paper and paperboard	6.84	2.90	7.94	2.35	7.38	11.63	5.87	6.60	7.99	0.04
Paper containers and products	56.92	20.46	60.93	18.29	36.17	123.75	49.01	41.07	67.57	0.04
Printing and services to printing	3.67	1.41	24.82	4.44	4.21	12.32	5.68	4.77	4.52	1.28
Publishing, recorded media, etc.	1.62	0.45	2.86	1.38	3.39	7.49	1.15	1.55	1.56	0.14
Petroleum and coal products	34.01	3.68	18.87	6.87	3.14	34.42	15.63	6.35	5.13	0.39
Basic chemicals	10.15	9.92	11.82	12.47	9.17	45.74	37.50	2.30	3.68	1.83
Paints	0.16	0.06	0.30	0.20	0.14	1.35	0.15	0.09	0.13	0.03
Medicinal and pharmaceutical products, pesticides	1.17	0.62	1.99	1.03	1.59	4.09	1.15	0.88	2.51	0.15
Soap and detergents	0.26	0.10	0.52	0.32	0.41	1.56	0.35	0.19	0.23	0.18
Cosmetics and toiletry preparations	0.21	0.19	0.16	0.21	0.15	0.51	0.31	0.03	0.03	0.01
Other chemical products	0.39	0.27	0.91	0.49	1.02	1.75	0.70	1.59	0.62	0.07
Rubber products	0.15	0.12	0.33	0.12	0.54	0.67	0.09	0.07	0.09	0.02
Plastic products	82.06	44.77	42.29	35.78	34.92	142.44	189.32	6.47	8.94	0.69
Glass and glass products	100.47	0.71	0.29	0.16	1.26	14.66	98.97	35.95	53.67	0.02
Ceramic products	0.08	0.25	0.19	0.11	0.11	0.45	0.07	0.05	0.09	0.01
Cement, lime and concrete slurry	0.41	0.31	0.70	0.33	0.57	2.36	0.28	0.23	0.27	0.05
Plaster and other concrete products	0.17	0.12	0.26	0.12	0.39	0.83	0.15	0.12	0.15	0.02
Other non-metallic mineral products	0.23	0.29	0.58	0.30	1.24	0.86	0.04	0.03	0.08	0.04
Iron and steel	2.35	0.48	1.84	1.12	0.90	7.58	3.15	3.29	0.51	0.10
Basic non-ferrous metal and products	3.74	1.40	3.34	1.91	4.67	24.99	4.23	2.40	1.17	0.55
Structural metal products	6.55	0.31	0.75	0.35	0.71	4.18	6.43	4.59	3.27	0.06
Sheet metal products	89.94	5.36	4.63	0.90	1.05	30.39	176.01	90.57	3.02	0.03
Fabricated metal products	2.46	0.67	1.86	1.14	3.22	5.69	4.11	4.58	1.63	0.11
Motor vehicles and parts, other transport equipment	1.98	1.01	3.14	1.66	3.04	5.26	4.58	1.91	1.87	0.14
Ships and boats	0.18	0.14	0.71	0.26	0.75	2.57	0.91	0.24	0.25	0.01
Railway equipment	0.09	0.03	0.13	0.06	0.28	0.28	0.08	0.05	0.08	0.01
Aircraft	0.03	0.01	0.08	0.05	0.04	0.13	0.07	0.06	0.06	0.00
Photographic and scientific equipment	0.73	0.39	1.25	0.67	0.54	3.24	0.68	0.61	0.56	0.07
Electronic equipment	0.82	0.45	1.38	0.91	1.70	7.70	20.92	1.94	1.40	0.08

Table B.1(c) Australia input-output flow table with direct allocation of imports – $2009m (continued)

	Fruit and vegetable products	Oils and fats	Flour mill products and cereal foods	Bakery products	Confectionery	Other food products	Soft drinks, cordials and syrups	Beer and malt	Wine, spirits and tobacco products	Textile fibres, yarns and woven fabrics
Household appliances	0.49	0.26	0.83	0.40	0.47	1.70	0.32	1.00	0.31	0.04
Other electrical equipment	1.11	0.58	2.81	1.67	2.07	5.12	3.02	2.70	2.23	0.11
Agricultural, mining, etc. machinery	1.13	0.44	1.28	0.63	0.61	2.96	1.04	2.24	0.57	0.08
Other machinery and equipment	5.08	1.15	3.64	4.66	3.44	15.66	14.74	2.45	1.17	0.12
Prefabricated buildings	0.11	0.04	0.17	0.07	0.08	0.32	0.07	0.09	0.10	0.01
Furniture	1.11	0.35	1.17	1.33	3.72	2.56	3.45	0.89	0.56	0.16
Other manufacturing	4.51	7.92	10.19	30.80	8.80	39.44	5.72	3.53	3.83	0.83
Electricity supply	25.55	13.35	67.09	22.19	22.46	74.60	14.75	27.84	7.75	4.56
Gas supply	17.52	6.39	16.22	13.33	3.92	44.98	21.97	8.72	1.54	0.05
Water supply, sewerage and drainage services	14.97	3.53	15.91	3.49	7.89	29.42	6.99	26.34	1.87	4.92
Residential building	1.25	0.98	2.70	1.10	2.29	5.53	1.78	0.70	2.27	0.04
Other construction	1.69	1.32	3.65	1.49	3.09	7.35	2.39	0.94	2.99	0.05
Construction trade services	14.06	13.28	28.53	13.61	33.90	32.89	14.25	11.72	13.02	0.84
Wholesale trade	256.71	87.05	352.17	188.32	181.41	663.59	168.97	148.98	180.63	25.90
Wholesale mechanical repairs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other wholesale repairs	0.52	0.84	5.56	36.21	2.09	24.87	11.47	3.89	2.64	1.20
Retail trade	28.66	7.13	74.95	223.70	161.67	269.10	11.64	9.31	53.03	1.73
Retail mechanical repairs	27.40	13.85	52.14	13.81	17.75	72.46	65.97	11.19	3.51	1.05
Other retail repairs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Accommodation, cafes and restaurants	6.22	4.72	15.34	26.09	22.38	66.55	158.16	111.28	80.09	0.34
Road transport	196.62	78.00	379.00	96.47	62.86	535.91	80.28	177.23	67.85	21.73
Rail, pipeline and other transport	8.36	2.12	29.22	5.66	2.17	24.52	7.07	21.73	3.97	2.78
Water transport	1.46	1.97	2.00	0.88	2.02	33.02	1.17	0.53	2.38	0.20
Air and space transport	9.85	5.40	17.88	3.84	5.24	17.40	2.68	2.09	2.97	0.21
Services to transport, storage	15.49	43.50	122.16	42.28	46.19	411.25	133.92	113.20	51.45	1.73
Communication services	12.81	5.59	77.64	13.57	11.80	52.85	26.60	10.13	13.77	1.56
Finance	37.33	29.99	103.52	36.09	19.16	259.28	26.98	129.33	31.77	8.61
Ownership of dwellings	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other property services	6.76	4.37	18.42	22.97	5.11	37.14	24.47	3.29	6.25	0.39
Scientific research, technical and computer services	40.07	2.83	50.28	32.61	11.23	149.39	41.25	1.24	28.04	1.24
Legal, accounting, marketing and business management services	34.60	22.22	175.27	26.56	90.05	220.34	64.42	54.79	54.79	2.01
Other business services	122.36	6.77	42.08	35.94	9.25	120.98	49.70	5.45	62.61	0.75

Table B.1(c) Australia input-output flow table with direct allocation of imports – $2009m (continued)

	Fruit and vegetable products	Oils and fats	Flour mill products and cereal foods	Bakery products	Confectionery	Other food products	Soft drinks, cordials and syrups	Beer and malt	Wine, spirits and tobacco products	Textile fibres, yarns and woven fabrics
Government administration	0.78	0.89	9.81	2.34	3.87	36.77	14.61	2.84	2.40	0.03
Defence	0.21	0.02	0.29	0.15	0.03	1.13	0.37	0.00	0.13	0.00
Education	3.94	4.36	8.35	8.00	6.74	12.70	9.58	6.39	3.40	0.10
Health services	0.10	0.06	0.31	0.21	0.42	0.84	0.87	0.14	4.33	0.00
Community services	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Motion picture, radio and television services	9.19	0.00	10.63	5.93	18.76	55.10	24.27	5.85	5.50	0.00
Libraries, museums and the arts	0.00	0.00	0.00	0.00	1.57	0.00	0.00	0.23	0.31	0.00
Sport, gambling and recreational services	0.14	0.01	0.04	0.08	0.06	2.33	0.50	0.36	7.06	0.00
Personal services	0.22	0.14	0.33	0.61	0.27	1.35	1.21	0.13	0.12	0.01
Other services	2.20	0.19	4.75	1.01	1.36	3.26	0.68	0.33	1.17	0.00
Total intermediate usage including imports	**2832**	**1291**	**5581**	**3002**	**2710**	**9080**	**2184**	**2011**	**2229**	**558**
Wages and salaries	440	71	578	1135	948	2329	632	442	1352	405
Gross surplus	776	345	442	364	236	821	1401	1407	2827	109
Indirect taxes on production	96	55	133	124	105	292	94	74	384	144
Total gross output	**4144**	**1762**	**6734**	**4625**	**4000**	**12522**	**4312**	**3933**	**6791**	**1216**
Value added at factor cost to output ratio	0.32	0.27	0.17	0.35	0.32	0.27	0.49	0.49	0.67	0.54
Share of wages and mixed income in value added	0.35	0.17	0.54	0.78	0.78	0.73	0.31	0.24	0.31	0.62
Employment to gross output ratio	5.77	4.40	7.08	21.45	6.80	6.26	4.05	3.14	3.71	5.99
Foreign ownership ratio	0.37	0.42	0.43	0.23	0.32	0.10	0.50	0.29	0.15	0.14
Direct tax rate on surplus	0.02	0.01	0.06	0.09	0.07	0.19	0.15	0.15	0.03	0.02
Indirect tax rate on production	0.05	0.09	0.06	0.06	0.06	0.05	0.03	0.03	0.08	0.27
Foreign income payout ratio	0.22	0.31	0.18	0.05	0.06	0.02	0.28	0.18	0.09	0.04
Replacement depreciation to value added ratio	0.13	0.10	0.17	0.22	0.21	0.14	0.13	0.05	0.11	0.09
Net national product ratio	0.65	0.59	0.66	0.74	0.73	0.84	0.59	0.77	0.80	0.87
Domestic income distribution ratio	0.38	0.42	0.23	0.15	0.13	0.21	0.28	0.43	0.52	0.24

Table B.1(d) Australia input-output flow table with direct allocation of imports – $2009m (continued)

	Textile products	Knitting mill products	Clothing	Footwear	Leather and leather products	Sawmill products	Other wood products	Pulp, paper and paperboard	Paper containers and products	Printing and services to printing
Sheep	0.01	0.00	0.08	0.00	41.29	0.00	0.00	0.00	0.00	0.00
Grains	0.02	0.01	0.01	0.02	0.01	0.00	0.00	0.00	0.00	0.00
Beef cattle	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dairy cattle	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Poultry	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other agriculture	1.93	0.07	0.22	0.14	6.11	0.00	0.00	0.00	0.00	0.61
Services to agriculture, hunting and trapping	0.28	8.99	3.91	0.04	42.09	0.00	0.00	0.00	0.00	0.00
Forestry and logging	0.00	0.00	0.00	0.00	0.00	747.20	164.62	74.11	13.12	3.76
Commercial fishing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coal	9.00	0.43	0.01	0.00	0.01	0.21	1.70	2.02	1.50	0.38
Gas	7.69	1.01	0.86	0.42	0.22	12.29	21.49	34.76	39.60	14.18
LNG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Oil	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Iron ores	0.00	0.00	0.00	0.00	0.00	0.03	0.04	0.01	0.02	0.08
Non-ferrous metal ores	0.01	0.01	0.01	0.00	0.01	1.12	0.36	0.02	0.07	0.26
Other mining	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.00	0.01	0.03
Services to mining	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Meat and meat products	12.93	0.11	18.95	0.02	325.32	0.27	0.47	0.09	0.21	0.70
Dairy products	0.07	0.07	0.11	0.03	0.05	0.24	0.37	0.06	0.17	0.41
Fruit and vegetable products	0.14	0.09	0.26	0.03	1.71	0.26	0.42	0.08	0.19	0.63
Oils and fats	0.08	0.04	0.06	0.01	0.02	0.13	0.16	0.06	0.07	0.30
Flour mill products and cereal foods	0.10	0.11	0.19	0.04	0.08	0.34	0.51	0.09	0.25	0.78
Bakery products	0.08	0.09	0.16	0.03	0.07	0.24	0.41	0.07	0.18	0.62
Confectionery	0.07	0.08	0.14	0.03	0.06	0.22	0.37	0.06	0.16	0.55
Other food products	0.94	0.25	0.75	0.13	4.19	1.16	2.55	0.37	0.81	2.03
Soft drinks, cordials and syrups	0.08	0.02	0.03	0.01	0.01	0.07	0.10	0.14	0.23	2.15
Beer and malt	0.07	0.06	0.03	0.01	0.01	0.32	0.24	0.04	0.12	0.49
Wine, spirits and tobacco products	0.51	0.43	0.05	0.01	0.02	1.31	1.79	0.31	0.44	4.40
Textile fibres, yarns and woven fabrics	22.20	14.29	20.17	0.65	0.34	0.23	0.71	0.06	1.06	2.29
Textile products	3.07	6.05	11.20	0.22	0.51	0.26	3.53	0.05	1.12	1.55
Knitting mill products	7.17	45.85	39.29	0.14	0.11	0.17	0.24	0.04	1.52	0.86
Clothing	1.38	3.37	37.10	3.23	3.23	0.81	1.49	0.20	0.69	6.20

Table B.1(d) Australia input-output flow table with direct allocation of imports – $2009m (continued)

	Textile products	Knitting mill products	Clothing	Footwear	Leather and leather products	Sawmill products	Other wood products	Pulp, paper and paperboard	Paper containers and products	Printing and services to printing
Footwear	0.10	0.12	3.21	11.62	2.69	0.23	0.41	0.04	0.12	0.99
Leather and leather products	2.02	0.58	5.40	8.52	77.73	0.30	0.31	0.06	0.20	0.56
Sawmill products	0.16	0.12	0.18	0.08	0.11	318.93	539.16	25.54	1.34	1.04
Other wood products	1.24	0.34	1.91	0.24	0.39	38.14	397.97	0.68	1.80	15.12
Pulp, paper and paperboard	0.51	0.35	0.61	0.21	0.06	4.88	4.98	5.40	28.76	148.32
Paper containers and products	0.73	2.52	3.16	0.91	0.28	4.85	6.75	1.81	71.55	69.79
Printing and services to printing	23.16	24.62	10.76	0.88	0.74	7.45	17.03	6.35	35.87	373.65
Publishing, recorded media, etc.	0.93	0.84	10.90	0.28	2.44	1.94	10.72	19.85	34.30	43.88
Petroleum and coal products	1.89	0.36	0.60	0.12	0.22	11.84	8.63	5.93	2.31	10.66
Basic chemicals	17.21	25.93	4.83	0.89	5.79	22.06	47.29	15.10	63.39	126.17
Paints	0.19	0.25	0.10	0.04	0.06	1.18	19.87	0.21	1.55	5.27
Medicinal and pharmaceutical products, pesticides	0.95	0.56	0.78	0.58	0.56	4.80	4.15	3.59	3.96	7.58
Soap and detergents	1.34	0.11	0.13	0.05	0.12	2.02	1.68	1.29	2.14	4.85
Cosmetics and toiletry preparations	0.03	0.01	0.02	0.01	0.01	0.13	0.09	0.04	0.09	0.08
Other chemical products	6.00	0.44	0.28	1.50	0.29	6.15	64.21	2.09	13.11	79.28
Rubber products	0.31	0.02	0.10	0.39	0.04	0.16	0.85	0.22	2.03	4.73
Plastic products	14.14	9.45	4.81	1.67	0.93	4.73	26.62	2.35	31.08	265.05
Glass and glass products	1.59	0.07	4.21	1.59	0.55	7.69	15.00	0.08	1.15	3.48
Ceramic products	0.08	0.02	0.18	0.08	0.02	0.17	0.62	0.55	0.86	0.48
Cement, lime and concrete slurry	0.15	0.17	0.18	0.08	0.08	1.74	1.88	0.42	0.98	1.00
Plaster and other concrete products	0.08	0.05	0.10	0.05	0.04	0.92	29.72	0.46	0.79	1.97
Other non-metallic mineral products	0.44	0.21	0.05	0.01	0.01	2.47	5.53	0.72	0.64	0.99
Iron and steel	1.66	0.43	0.29	0.15	0.15	3.93	41.36	2.48	2.66	6.72
Basic non-ferrous metal and products	5.84	2.62	1.34	0.77	0.77	13.21	71.81	2.40	13.28	72.79
Structural metal products	5.47	0.16	0.30	0.06	0.19	1.92	112.06	29.03	0.59	2.47
Sheet metal products	0.42	0.07	0.19	0.06	0.07	0.52	16.76	0.21	1.63	6.76
Fabricated metal products	3.10	7.68	0.51	0.26	0.25	10.98	53.45	6.47	4.73	16.28
Motor vehicles and parts, other transport equipment	0.96	0.39	0.56	0.21	0.23	1.94	9.09	0.54	2.16	8.09
Ships and boats	0.04	0.04	0.05	0.02	0.03	1.20	1.33	0.43	1.29	3.36
Railway equipment	0.02	0.03	0.03	0.01	0.02	0.10	0.17	0.02	0.11	0.25
Aircraft	0.01	0.01	0.02	0.00	0.01	0.03	0.05	0.23	0.18	0.09
Photographic and scientific equipment	0.20	0.14	0.85	0.14	0.18	10.90	12.85	0.34	1.14	12.35
Electronic equipment	0.18	0.20	0.33	0.17	0.20	10.04	11.69	0.34	0.93	8.86

Table B.1(d) Australia input-output flow table with direct allocation of imports – $2009m (continued)

	Textile products	Knitting mill products	Clothing	Footwear	Leather and leather products	Sawmill products	Other wood products	Pulp, paper and paperboard	Paper containers and products	Printing and services to printing
Household appliances	0.08	0.09	0.15	0.03	0.07	8.07	9.27	0.09	0.24	6.48
Other electrical equipment	0.43	0.24	0.39	0.09	0.16	10.95	14.51	4.89	4.24	12.69
Agricultural, mining, etc. machinery	0.16	0.17	0.67	0.06	0.14	10.35	13.11	0.16	0.46	8.63
Other machinery and equipment	0.30	0.25	1.18	0.34	0.29	11.64	16.73	4.10	1.10	10.57
Prefabricated buildings	0.14	0.05	0.12	0.04	0.02	0.25	2.36	0.02	0.13	0.30
Furniture	0.79	0.67	1.09	0.31	0.30	0.74	11.01	0.20	0.67	1.60
Other manufacturing	12.83	6.13	37.44	1.00	0.63	5.36	36.53	1.67	11.09	19.99
Electricity supply	10.21	12.10	3.22	1.44	2.02	85.97	130.66	57.67	80.66	109.78
Gas supply	6.23	0.64	0.68	0.12	0.18	6.15	11.92	25.50	31.94	11.61
Water supply, sewerage and drainage services	4.28	11.64	1.12	0.25	1.49	3.29	12.55	11.18	13.54	17.38
Residential building	0.85	0.62	0.18	0.09	0.21	4.79	5.08	0.37	2.70	8.08
Other construction	1.14	0.83	0.24	0.12	0.28	9.05	9.46	0.57	3.90	11.12
Construction trade services	3.57	4.14	2.42	1.29	1.51	63.01	54.18	4.43	14.29	28.23
Wholesale trade	50.85	53.40	98.73	20.51	40.23	226.90	323.00	45.86	117.14	375.61
Wholesale mechanical repairs	0.00	0.00	0.00	0.00	0.00	12.32	8.92	0.70	3.16	0.00
Other wholesale repairs	10.15	3.19	0.82	6.35	4.71	57.68	67.89	6.87	24.56	47.52
Retail trade	9.64	118.90	57.37	2.74	3.24	14.68	25.55	8.39	24.97	69.28
Retail mechanical repairs	15.54	11.50	0.00	8.90	5.31	25.33	14.96	4.27	37.01	147.03
Other retail repairs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Accommodation, cafes and restaurants	8.95	7.55	7.30	0.13	3.10	14.68	20.64	2.06	14.21	84.91
Road transport	20.91	17.58	19.76	13.54	52.95	237.59	128.80	36.86	58.35	126.20
Rail, pipeline and other transport	2.14	16.41	0.25	0.49	0.51	8.73	3.08	6.72	5.98	4.82
Water transport	3.11	1.14	2.58	1.09	0.33	8.66	3.05	9.27	10.32	5.49
Air and space transport	2.70	4.94	7.03	0.40	1.02	2.24	9.69	0.50	5.20	79.96
Services to transport, storage	5.36	3.40	21.75	3.52	3.32	279.77	261.89	26.22	217.09	126.76
Communication services	8.58	6.94	8.93	1.96	1.96	30.36	77.84	3.43	16.84	190.35
Finance	20.83	11.03	12.49	2.42	5.80	45.67	75.02	15.47	33.21	167.58
Ownership of dwellings	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other property services	2.69	1.93	8.64	1.67	4.18	244.87	190.88	2.13	19.76	153.39
Scientific research, technical and computer services	42.99	24.21	8.26	1.44	5.98	27.55	42.09	1.71	28.75	226.54
Legal, accounting, marketing and business management services	37.53	18.85	19.13	5.26	8.00	98.48	170.73	9.10	174.78	425.72
Other business services	6.66	14.71	31.08	7.57	8.61	103.11	154.47	8.98	93.05	409.15

Table B.1(d) Australia input-output flow table with direct allocation of imports – $2009m (continued)

	Textile products	Knitting mill products	Clothing	Footwear	Leather and leather products	Sawmill products	Other wood products	Pulp, paper and paperboard	Paper containers and products	Printing and services to printing
Government administration	0.58	0.60	0.07	0.01	0.06	7.82	7.34	1.47	13.86	34.27
Defence	0.08	0.19	0.03	0.01	0.02	0.11	0.13	0.00	0.12	0.42
Education	1.91	1.35	16.06	0.28	0.79	5.13	9.23	1.56	6.27	26.60
Health services	0.02	0.06	5.31	5.53	0.01	4.79	7.61	0.18	1.73	8.84
Community services	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Motion picture, radio and television services	0.72	0.18	1.02	0.19	0.00	1.50	31.55	0.00	0.62	1.51
Libraries, museums and the arts	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.76	2.22
Sport, gambling and recreational services	0.03	0.02	0.02	0.00	0.01	0.04	0.06	0.01	0.04	0.25
Personal services	0.39	0.07	0.00	0.00	0.00	0.40	0.32	0.07	0.55	2.26
Other services	0.00	0.00	0.68	0.04	0.20	1.33	1.37	1.75	6.48	9.71
Total intermediate usage including imports	**725**	**740**	**999**	**245**	**728**	**3232**	**4258**	**717**	**2046**	**5934**
Wages and salaries	672	81	732	111	151	448	1626	240	1481	3227
Gross surplus	145	51	418	77	191	768	608	473	610	1743
Indirect taxes on production	51	30	83	16	24	93	120	57	125	251
Total gross output	**1594**	**902**	**2232**	**449**	**1094**	**4542**	**6612**	**1488**	**4262**	**11154**
Value added at factor cost to output ratio	0.54	0.18	0.55	0.45	0.33	0.29	0.36	0.52	0.52	0.47
Share of wages and mixed income in value added	1.01	0.65	0.79	0.64	0.50	0.39	0.87	0.32	0.69	0.69
Employment to gross output ratio	13.65	8.43	17.35	10.39	5.84	7.68	14.87	3.47	7.45	9.88
Foreign ownership ratio	0.03	0.09	0.02	0.15	0.22	0.05	0.15	0.29	0.27	0.05
Direct tax rate on surplus	0.25	0.04	0.08	0.08	0.02	0.06	0.13	0.02	0.03	0.06
Indirect tax rate on production	0.05	0.15	0.06	0.07	0.04	0.04	0.03	0.07	0.05	0.03
Foreign income payout ratio	0.00	0.03	0.00	0.05	0.11	0.02	0.02	0.16	0.08	0.01
Replacement depreciation to value added ratio	0.15	0.09	0.06	0.09	0.06	0.09	0.18	0.54	0.13	0.13
Net national product ratio	0.85	0.89	0.93	0.87	0.83	0.88	0.80	0.29	0.79	0.86
Domestic income distribution ratio	0.00	0.26	0.18	0.27	0.36	0.49	0.10	0.39	0.20	0.27

Table B.1(e) Australia input-output flow table with direct allocation of imports – $2009m (continued)

	Publishing, recorded media, etc.	Petroleum and coal products	Basic chemicals	Paints	Medicinal and pharmaceutical products, pesticides	Soap and detergents	Cosmetics and toiletry preparations	Other chemical products	Rubber products	Plastic products
Sheep	0.00	0.00	4.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grains	0.00	0.00	8.95	2.30	90.72	10.00	1.85	5.74	0.01	0.03
Beef cattle	0.00	0.00	23.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dairy cattle	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pigs	0.00	0.00	2.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Poultry	0.00	0.00	4.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other agriculture	1.98	0.00	0.52	0.68	0.05	0.25	0.04	0.20	3.14	55.40
Services to agriculture, hunting and trapping	0.00	0.00	7.66	3.90	0.00	8.89	5.40	2.86	0.00	0.00
Forestry and logging	0.66	0.00	17.31	0.12	10.12	0.00	1.57	9.86	0.00	0.00
Commercial fishing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coal	0.10	316.26	101.18	0.01	0.38	0.01	0.01	0.45	0.01	0.12
Gas	4.58	-4821.55	75.97	0.82	8.15	2.17	0.35	5.61	0.30	14.04
LNG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Oil	0.00	5844.66	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Iron ores	0.02	0.35	0.03	0.00	0.01	0.00	0.00	0.00	0.00	0.02
Non-ferrous metal ores	0.10	10.72	118.82	1.20	0.05	0.02	0.00	0.09	0.01	0.11
Other mining	0.01	3.98	75.39	0.03	0.03	0.40	0.07	4.16	0.03	0.14
Services to mining	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Meat and meat products	0.20	0.47	104.51	6.50	17.95	103.67	6.38	16.42	0.05	0.77
Dairy products	0.12	0.36	9.41	0.19	5.17	2.10	0.79	1.27	0.03	0.65
Fruit and vegetable products	0.17	0.60	2.05	0.18	1.04	0.48	0.12	0.45	0.04	0.68
Oils and fats	0.07	5.05	12.35	3.36	13.17	6.68	1.07	0.92	0.06	0.35
Flour mill products and cereal foods	0.20	0.57	39.21	1.48	3.03	2.69	0.75	3.45	0.05	0.83
Bakery products	0.16	0.44	1.86	0.06	0.57	0.14	0.04	0.19	0.04	0.66
Confectionery	0.14	0.39	2.13	0.08	0.51	0.14	0.04	0.21	0.03	0.59
Other food products	0.73	2.53	39.63	8.03	23.49	15.11	5.40	15.19	0.14	2.37
Soft drinks, cordials and syrups	0.38	0.40	8.32	0.02	0.97	1.41	0.51	2.57	0.01	0.28
Beer and malt	1.69	0.47	0.47	0.04	0.16	0.07	0.02	0.07	0.02	0.27
Wine, spirits and tobacco products	9.72	2.35	10.79	0.48	2.87	0.53	0.17	0.60	0.18	1.14
Textile fibres, yarns and woven fabrics	1.94	0.67	3.77	0.07	1.81	0.11	0.33	0.58	1.03	5.44
Textile products	0.70	0.44	1.81	0.13	0.33	0.31	0.21	0.34	0.16	2.26
Knitting mill products	0.98	0.54	0.66	0.03	0.26	0.07	0.03	0.09	0.02	2.95
Clothing	3.31	1.43	4.49	0.17	1.66	0.49	0.28	0.69	0.73	5.89

Table B.1(e) Australia input-output flow table with direct allocation of imports – $2009m (continued)

	Publishing, recorded media, etc.	Petroleum and coal products	Basic chemicals	Paints	Medicinal and pharmaceutical products, pesticides	Soap and detergents	Cosmetics and toiletry preparations	Other chemical products	Rubber products	Plastic products
Footwear	0.40	0.34	0.74	0.05	0.37	0.12	0.03	0.18	0.10	0.76
Leather and leather products	0.13	0.26	0.73	0.07	0.30	0.13	0.04	0.16	0.21	0.74
Sawmill products	1.24	0.83	1.90	0.07	1.11	0.20	0.09	1.34	0.06	1.87
Other wood products	1.56	6.56	17.79	0.56	3.63	2.08	0.47	3.47	0.71	19.22
Pulp, paper and paperboard	176.63	1.64	2.90	0.15	10.87	2.32	0.45	1.27	0.40	8.86
Paper containers and products	8.72	1.20	22.54	2.66	110.93	19.01	3.94	9.79	0.37	28.04
Printing and services to printing	135.08	5.43	18.01	2.06	16.55	2.52	1.31	4.91	1.15	24.69
Publishing, recorded media, etc.	203.77	10.17	31.72	1.88	34.52	1.73	1.65	16.43	3.43	44.21
Petroleum and coal products	10.34	399.46	200.51	14.46	5.59	3.59	2.39	18.96	6.99	29.97
Basic chemicals	4.97	351.43	1388.08	58.61	58.97	94.98	33.06	172.44	23.88	1102.74
Paints	0.21	4.82	45.64	2.58	1.21	0.95	0.14	2.96	0.13	5.58
Medicinal and pharmaceutical products, pesticides	0.29	4.10	710.67	2.07	98.70	2.47	0.60	6.97	1.29	9.31
Soap and detergents	0.14	10.01	35.63	1.77	2.17	3.16	0.70	5.24	0.39	3.65
Cosmetics and toiletry preparations	0.03	0.91	2.64	0.03	0.44	0.04	0.04	0.19	0.02	0.22
Other chemical products	9.13	26.59	81.52	1.60	6.34	2.93	1.77	102.90	0.74	40.42
Rubber products	1.07	1.48	5.63	0.18	0.61	0.09	0.04	0.70	13.79	18.05
Plastic products	11.49	17.83	133.65	4.36	135.75	72.31	24.31	39.88	5.55	259.92
Glass and glass products	0.51	1.65	5.14	0.11	35.39	8.30	0.28	7.18	0.15	14.59
Ceramic products	0.52	0.63	1.12	0.08	1.95	0.22	0.08	1.25	0.02	1.30
Cement, lime and concrete slurry	0.48	5.42	7.03	0.54	1.98	1.76	0.24	2.30	0.28	2.64
Plaster and other concrete products	0.40	1.30	8.10	0.56	0.71	0.17	0.06	0.50	0.17	5.92
Other non-metallic mineral products	0.59	0.46	3.00	1.14	0.84	0.60	0.21	1.02	0.51	6.18
Iron and steel	1.46	3.13	17.51	0.71	3.82	0.90	0.34	2.84	0.72	9.35
Basic non-ferrous metal and products	4.66	55.07	131.31	6.08	12.95	16.92	1.88	12.09	2.99	185.01
Structural metal products	1.00	1.67	6.04	0.95	3.16	0.77	0.13	1.42	0.19	23.38
Sheet metal products	0.87	7.93	14.61	13.98	35.89	1.83	2.17	9.49	0.12	13.24
Fabricated metal products	16.74	3.46	52.10	2.78	24.60	4.51	1.31	14.62	7.68	29.18
Motor vehicles and parts, other transport equipment	1.30	3.18	5.11	0.37	2.85	0.87	0.33	1.35	0.78	9.03
Ships and boats	6.30	4.66	3.65	0.16	0.44	0.29	0.07	0.43	0.04	0.50
Railway equipment	0.09	0.87	0.30	0.01	0.19	0.03	0.02	0.05	0.04	0.87
Aircraft	0.08	0.34	0.10	0.00	0.05	0.01	0.00	0.01	0.00	0.26
Photographic and scientific equipment	13.22	29.51	6.80	0.11	3.31	0.32	0.11	0.51	0.10	2.45
Electronic equipment	10.98	26.58	5.73	0.12	0.98	0.30	0.09	1.26	0.23	1.97

Table B.1(e) Australia input-output flow table with direct allocation of imports – $2009m (continued)

	Publishing, recorded media, etc.	Petroleum and coal products	Basic chemicals	Paints	Medicinal and pharmaceutical products, pesticides	Soap and detergents	Cosmetics and toiletry preparations	Other chemical products	Rubber products	Plastic products
Household appliances	8.72	21.70	4.39	0.08	0.91	0.22	0.05	0.28	0.07	2.13
Other electrical equipment	12.74	28.32	9.02	0.21	2.75	0.55	0.18	0.98	4.86	9.36
Agricultural, mining, etc. machinery	11.02	27.82	9.39	0.15	1.97	0.48	0.12	0.72	0.09	1.70
Other machinery and equipment	11.16	28.36	14.38	0.75	4.46	1.37	0.37	2.85	0.37	6.50
Prefabricated buildings	0.08	0.19	0.36	0.01	0.18	0.04	0.01	0.08	0.01	0.54
Furniture	0.66	0.93	2.94	0.16	1.41	0.29	0.09	0.58	0.27	1.78
Other manufacturing	2.55	5.99	17.62	1.09	11.44	4.27	1.64	7.89	0.52	32.11
Electricity supply	21.64	84.85	164.76	2.61	40.78	6.38	3.07	20.08	7.53	154.35
Gas supply	3.68	24.68	41.45	0.59	6.46	1.60	0.23	4.01	0.10	8.72
Water supply, sewerage and drainage services	5.75	62.36	54.44	0.86	16.99	3.20	3.06	20.94	1.52	10.52
Residential building	5.46	39.76	5.17	0.44	5.70	0.76	0.25	0.91	0.90	5.33
Other construction	7.72	164.87	6.97	0.59	7.68	1.02	0.34	1.23	1.22	7.19
Construction trade services	14.56	735.40	32.56	5.16	21.22	10.55	3.16	11.44	8.01	35.76
Wholesale trade	107.35	606.03	845.70	35.16	385.31	80.88	23.92	111.75	23.11	395.23
Wholesale mechanical repairs	0.00	0.00	1.87	0.53	1.01	1.03	0.31	1.12	0.00	0.00
Other wholesale repairs	94.95	2.84	48.42	3.02	4.31	1.71	0.28	1.05	7.00	78.60
Retail trade	51.50	42.31	69.81	2.81	52.62	11.12	2.38	13.11	2.44	45.36
Retail mechanical repairs	76.80	33.13	72.66	4.04	24.56	7.79	1.82	15.81	0.46	23.16
Other retail repairs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Accommodation, cafes and restaurants	89.46	131.70	63.86	3.18	76.70	7.31	5.36	20.12	0.65	19.13
Road transport	43.72	126.10	363.08	12.71	160.72	41.78	11.39	51.06	8.02	178.81
Rail, pipeline and other transport	4.66	17.14	25.23	0.42	6.58	1.48	0.37	2.49	0.21	66.14
Water transport	5.22	191.07	16.16	0.16	2.17	0.66	0.29	6.16	1.11	9.22
Air and space transport	55.06	17.51	18.53	1.61	17.28	3.68	1.19	3.17	0.65	10.11
Services to transport, storage	356.83	135.90	383.77	7.33	232.04	10.43	2.87	103.22	4.72	67.35
Communication services	170.76	135.89	50.37	8.69	41.24	7.65	2.16	18.39	3.56	65.56
Finance	295.24	77.38	116.25	5.88	101.67	15.98	4.36	16.14	10.52	79.55
Ownership of dwellings	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other property services	553.54	204.32	22.22	5.35	32.66	4.29	2.72	11.95	1.85	42.95
Scientific research, technical and computer services	157.07	23.54	126.68	6.73	340.76	24.98	5.38	14.23	18.84	126.30
Legal, accounting, marketing and business management services	442.18	780.98	317.70	15.51	335.97	10.69	4.32	28.98	21.79	294.02
Other business services	392.91	583.24	134.30	2.75	510.35	38.26	12.74	32.26	109.60	256.18

Table B.1(e) Australia input-output flow table with direct allocation of imports – $2009m (continued)

	Publishing, recorded media, etc.	Petroleum and coal products	Basic chemicals	Paints	Medicinal and pharmaceutical products, pesticides	Soap and detergents	Cosmetics and toiletry preparations	Other chemical products	Rubber products	Plastic products
Government administration	114.98	25.43	98.31	5.44	2.85	7.27	1.75	5.60	0.51	9.02
Defence	0.35	0.10	0.77	0.04	1.18	0.09	0.03	0.06	0.10	0.51
Education	8.05	51.17	19.34	2.44	14.48	0.77	1.25	4.75	1.19	14.17
Health services	38.08	1.18	4.83	1.66	76.87	0.16	0.03	0.17	0.10	0.77
Community services	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Motion picture, radio and television services	113.70	14.89	6.54	4.43	32.56	4.13	9.07	0.00	0.05	11.86
Libraries, museums and the arts	51.32	0.00	0.24	1.11	0.00	14.16	1.14	1.82	0.00	0.00
Sport, gambling and recreational services	9.12	0.17	1.77	0.01	0.22	0.83	0.18	0.06	1.76	1.96
Personal services	8.33	0.00	0.75	0.15	0.53	0.11	0.08	0.09	0.22	0.87
Other services	9.41	1.47	4.75	0.15	8.76	0.97	0.37	0.88	0.44	4.86
Total intermediate usage including imports	**5559**	**22850**	**8908**	**462**	**4088**	**1019**	**278**	**1488**	**432**	**5880**
Wages and salaries	3639	618	1642	532	1671	261	164	727	374	1963
Gross surplus	2523	2022	1242	82	711	259	115	145	195	776
Indirect taxes on production	369	364	235	34	173	36	21	53	44	192
Total gross output	**12090**	**25854**	**12027**	**1111**	**6644**	**1575**	**578**	**2413**	**1046**	**8810**
Value added at factor cost to output ratio	0.54	0.12	0.26	0.58	0.38	0.35	0.52	0.38	0.59	0.33
Share of wages and mixed income in value added	0.59	0.24	0.56	0.85	0.68	0.49	0.57	0.82	0.63	0.70
Employment to gross output ratio	7.72	2.27	2.67	10.14	8.08	5.80	6.76	9.72	8.69	9.14
Foreign ownership ratio	0.03	0.80	0.50	0.48	0.65	0.60	0.45	0.28	0.90	0.20
Direct tax rate on surplus	0.04	0.02	0.12	0.06	0.41	0.21	0.21	0.34	0.06	0.13
Indirect tax rate on production	0.05	0.02	0.04	0.05	0.05	0.04	0.06	0.04	0.07	0.04
Foreign income payout ratio	0.01	0.58	0.19	0.07	0.16	0.24	0.16	0.04	0.30	0.05
Replacement depreciation to value added ratio	0.01	0.23	0.24	0.14	0.15	0.13	0.15	0.37	0.09	0.20
Net national product ratio	0.98	0.19	0.58	0.79	0.69	0.63	0.70	0.59	0.61	0.75
Domestic income distribution ratio	0.37	0.15	0.19	0.08	0.09	0.16	0.19	0.11	0.03	0.21

Table B.1(f) Australia input-output flow table with direct allocation of imports – $2009m (continued)

	Glass and glass products	Ceramic products	Cement, lime and concrete slurry	Plaster and other concrete products	Other non-metallic mineral products	Iron and steel	Basic non-ferrous metal and products	Structural metal products	Sheet metal products	Fabricated metal products
Sheep	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grains	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Beef cattle	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dairy cattle	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Poultry	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.22	0.21	0.14
Services to agriculture, hunting and trapping	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Forestry and logging	0.00	0.00	0.00	0.00	0.00	0.65	8.80	0.00	0.00	0.00
Commercial fishing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coal	0.00	0.00	9.65	0.19	0.00	263.70	8.85	0.54	0.17	3.23
Gas	102.59	97.20	550.65	7.25	22.22	162.42	212.82	8.77	5.21	12.14
LNG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Oil	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Iron ores	0.01	0.00	0.04	0.01	0.00	837.81	1.93	30.04	0.03	16.00
Non-ferrous metal ores	0.05	0.00	0.12	72.63	14.97	24.75	25675.69	0.27	0.10	10.53
Other mining	40.68	0.00	683.28	184.78	19.97	582.95	220.53	2.72	0.07	2.67
Services to mining	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Meat and meat products	0.19	0.00	0.46	0.26	0.03	1.58	1.40	1.11	0.42	0.60
Dairy products	0.11	0.00	0.28	0.15	0.02	0.91	1.17	0.63	0.17	0.51
Fruit and vegetable products	0.19	0.00	0.41	0.23	0.03	1.14	1.25	0.93	0.24	0.47
Oils and fats	0.08	0.00	0.17	0.21	0.01	0.58	0.49	0.34	0.11	0.22
Flour mill products and cereal foods	0.20	0.00	0.50	0.30	0.04	1.42	1.50	1.13	0.29	0.59
Bakery products	0.16	0.00	0.40	0.22	0.02	1.23	1.25	0.92	0.23	0.47
Confectionery	0.14	0.00	0.36	0.20	0.02	1.04	1.09	0.81	0.21	0.41
Other food products	0.49	0.00	1.19	1.26	0.10	3.75	3.29	4.52	1.52	2.41
Soft drinks, cordials and syrups	0.06	0.00	0.10	0.06	0.01	0.36	0.28	0.20	0.06	0.11
Beer and malt	0.08	0.00	0.26	0.09	0.01	0.45	0.34	0.31	0.14	0.18
Wine, spirits and tobacco products	1.10	0.00	2.21	0.95	0.13	1.29	0.92	1.17	0.70	0.87
Textile fibres, yarns and woven fabrics	0.20	0.00	0.28	0.51	0.04	2.55	1.05	1.08	0.65	0.83
Textile products	0.46	0.00	0.72	1.17	0.04	2.40	1.74	7.43	0.34	4.98
Knitting mill products	0.10	0.00	0.19	1.54	0.02	0.97	0.64	0.61	1.29	0.39
Clothing	0.59	0.00	1.14	1.10	0.11	4.06	3.51	5.74	1.86	3.39

Table B.1(f) Australia input-output flow table with direct allocation of imports – $2009m (continued)

	Glass and glass products	Ceramic products	Cement, lime and concrete slurry	Plaster and other concrete products	Other non-metallic mineral products	Iron and steel	Basic non-ferrous metal and products	Structural metal products	Sheet metal products	Fabricated metal products
Footwear	0.19	0.00	0.30	0.26	0.03	0.76	0.73	0.71	0.27	0.86
Leather and leather products	1.63	0.00	0.46	0.36	0.06	0.44	0.64	1.04	0.19	4.43
Sawmill products	1.05	0.00	0.47	1.75	0.07	7.58	1.81	91.38	2.25	8.48
Other wood products	9.78	0.00	1.34	4.78	0.34	37.23	8.99	48.45	4.54	22.32
Pulp, paper and paperboard	0.85	0.00	5.03	2.30	0.10	1.96	0.79	1.86	0.44	1.56
Paper containers and products	3.83	0.00	52.97	9.97	0.84	4.12	2.47	5.31	1.24	11.82
Printing and services to printing	4.80	0.00	13.08	10.07	1.09	21.59	9.47	34.81	7.19	16.39
Publishing, recorded media, etc.	1.18	0.00	13.15	4.33	0.33	17.26	10.98	56.89	6.85	9.02
Petroleum and coal products	13.83	5.79	196.84	16.09	8.60	116.62	51.87	33.91	15.22	26.73
Basic chemicals	82.80	0.00	5.64	29.24	11.55	51.37	77.78	58.12	13.67	48.82
Paints	3.53	0.00	0.25	0.88	0.22	36.81	1.34	2.98	3.20	5.93
Medicinal and pharmaceutical products, pesticides	2.33	0.00	0.79	1.57	0.36	6.20	5.39	1.96	1.14	3.52
Soap and detergents	4.13	0.00	0.36	2.26	0.50	3.42	2.06	0.54	0.49	2.15
Cosmetics and toiletry preparations	0.38	0.00	0.05	0.08	0.01	0.32	0.21	0.25	0.04	0.09
Other chemical products	3.57	0.00	2.00	5.55	2.40	11.27	3.04	6.60	1.43	8.14
Rubber products	0.20	0.00	0.09	0.48	0.11	1.75	7.01	1.85	1.51	6.76
Plastic products	12.24	0.00	4.58	10.39	3.54	19.14	18.96	47.13	11.77	16.74
Glass and glass products	309.44	0.00	0.90	1.63	0.81	1.67	2.91	170.33	1.84	8.03
Ceramic products	0.90	0.00	74.46	33.96	1.45	6.29	2.23	7.34	0.17	5.99
Cement, lime and concrete slurry	8.55	0.00	1038.10	481.95	18.61	64.79	42.79	8.56	1.61	5.11
Plaster and other concrete products	9.49	0.00	92.16	112.04	9.88	10.25	6.57	19.57	1.24	1.99
Other non-metallic mineral products	22.40	0.00	20.86	13.75	3.54	5.17	6.06	12.31	2.06	9.35
Iron and steel	20.12	0.00	29.12	71.25	3.04	2416.38	237.64	1992.57	334.37	750.88
Basic non-ferrous metal and products	129.53	0.00	8.90	31.74	2.84	2125.18	15296.53	1395.96	1131.20	955.96
Structural metal products	22.62	0.00	8.62	115.15	14.35	65.54	74.88	1299.37	39.11	258.57
Sheet metal products	0.69	0.00	0.31	3.40	1.31	42.47	12.46	60.17	43.16	22.04
Fabricated metal products	5.86	0.00	3.47	12.61	1.71	117.47	47.28	406.52	64.17	153.78
Motor vehicles and parts, other transport equipment	20.52	0.00	4.03	4.74	1.07	21.71	11.71	18.57	8.25	13.76
Ships and boats	0.66	0.00	3.62	0.74	0.08	2.60	1.14	3.99	0.54	1.87
Railway equipment	0.06	0.00	0.12	0.38	0.02	3.32	0.71	0.41	0.22	0.45
Aircraft	0.04	0.00	0.06	0.05	0.00	0.34	0.19	0.11	0.03	0.05
Photographic and scientific equipment	0.34	0.00	0.85	1.08	0.06	6.67	5.93	2.76	0.88	1.69
Electronic equipment	0.90	0.00	1.16	0.82	0.12	5.26	3.13	18.81	1.76	3.31

Table B.1(f) Australia input-output flow table with direct allocation of imports – $2009m (continued)

	Glass and glass products	Ceramic products	Cement, lime and concrete slurry	Plaster and other concrete products	Other non-metallic mineral products	Iron and steel	Basic non-ferrous metal and products	Structural metal products	Sheet metal products	Fabricated metal products
Household appliances	2.42	0.00	0.57	0.50	0.06	2.61	1.92	2.39	0.96	1.40
Other electrical equipment	1.67	0.00	2.73	2.75	0.25	18.56	9.25	21.83	8.12	13.51
Agricultural, mining, etc. machinery	0.65	0.00	5.25	6.38	0.21	15.15	14.28	14.24	1.54	19.84
Other machinery and equipment	3.70	0.00	2.94	10.83	0.50	27.15	42.17	22.37	9.54	13.60
Prefabricated buildings	0.11	0.00	0.22	0.93	0.21	1.31	1.30	38.54	0.63	1.34
Furniture	0.86	0.00	0.93	1.44	0.51	11.75	7.69	13.57	2.58	8.53
Other manufacturing	3.79	0.00	2.53	5.40	1.48	71.17	160.88	27.82	6.45	8.91
Electricity supply	80.90	44.40	204.79	33.97	42.42	995.46	529.79	67.54	26.89	80.18
Gas supply	77.97	74.03	431.96	3.31	14.81	104.62	133.25	6.52	4.08	9.14
Water supply, sewerage and drainage services	7.92	0.00	16.50	9.61	0.80	94.92	20.66	6.46	1.71	5.88
Residential building	1.58	0.00	3.88	1.99	0.14	32.21	11.77	8.28	3.11	3.51
Other construction	2.18	0.00	6.11	2.77	0.19	43.55	15.94	11.18	4.20	4.73
Construction trade services	12.25	0.00	17.65	10.16	1.67	133.17	92.10	32.09	14.03	19.06
Wholesale trade	97.80	0.00	238.06	133.43	15.24	735.32	1176.60	551.40	164.68	290.43
Wholesale mechanical repairs	0.17	0.00	12.99	5.60	0.23	6.29	0.80	0.00	0.00	0.00
Other wholesale repairs	13.48	0.00	92.41	11.09	0.38	53.79	4.93	53.51	17.17	21.53
Retail trade	8.84	0.00	35.61	16.07	1.21	87.69	56.82	54.39	19.77	29.19
Retail mechanical repairs	3.44	0.00	24.00	7.02	0.29	15.88	5.30	15.52	6.74	5.24
Other retail repairs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Accommodation, cafes and restaurants	18.38	0.00	36.90	16.33	3.02	48.15	23.82	93.37	25.15	39.18
Road transport	73.46	0.00	564.22	181.37	22.43	620.55	415.74	186.63	48.57	94.16
Rail, pipeline and other transport	27.11	0.00	180.51	4.10	2.20	244.25	307.80	13.20	3.90	9.73
Water transport	2.44	0.00	25.05	5.94	1.51	44.38	220.56	31.51	4.77	8.24
Air and space transport	2.34	0.00	11.48	3.18	0.69	22.74	10.36	20.31	6.55	9.58
Services to transport, storage	30.96	0.00	131.37	56.99	3.37	282.86	148.82	217.46	139.14	130.69
Communication services	17.40	0.00	72.26	63.93	10.18	78.62	23.53	138.63	23.62	69.10
Finance	49.33	0.00	112.88	32.56	7.39	128.52	215.90	129.79	31.38	66.35
Ownership of dwellings	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other property services	15.82	0.00	34.83	11.67	0.73	1530.66	476.80	191.93	60.43	101.44
Scientific research, technical and computer services	45.33	0.00	238.43	32.76	2.47	277.10	114.57	218.39	70.27	63.88
Legal, accounting, marketing and business management services	37.71	0.00	107.18	205.19	11.96	163.92	57.77	235.96	77.37	151.19
Other business services	37.22	0.00	210.38	126.04	2.25	247.53	81.02	312.32	76.43	182.20

Table B.1(f) Australia input-output flow table with direct allocation of imports – $2009m (continued)

	Glass and glass products	Ceramic products	Cement, lime and concrete slurry	Plaster and other concrete products	Other non-metallic mineral products	Iron and steel	Basic non-ferrous metal and products	Structural metal products	Sheet metal products	Fabricated metal products
Government administration	2.32	0.00	11.23	3.49	0.18	35.22	3.79	12.85	8.37	6.70
Defence	0.16	0.00	0.53	0.16	0.01	0.50	0.26	1.02	0.47	0.31
Education	5.68	0.00	26.22	9.97	0.46	34.30	16.51	24.02	4.27	7.23
Health services	0.19	0.00	0.78	0.31	0.02	0.70	0.38	0.99	0.22	0.30
Community services	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Motion picture, radio and television services	1.31	0.00	1.22	11.85	0.58	0.94	0.01	9.12	0.29	4.99
Libraries, museums and the arts	0.32	0.00	0.43	0.47	0.00	0.00	0.00	0.00	0.00	0.00
Sport, gambling and recreational services	0.06	0.00	0.11	0.05	0.01	0.14	0.08	0.28	0.07	0.11
Personal services	0.13	0.00	0.33	0.18	0.01	0.94	0.05	0.49	0.32	0.36
Other services	0.52	0.00	2.81	3.09	0.03	2.16	1.07	8.32	2.56	3.51
Total intermediate usage including imports	**2034**	**230**	**6099**	**2622**	**356**	**15381**	**58564**	**10198**	**3063**	**5178**
Wages and salaries	609	507	1330	1254	536	3079	2786	2201	1078	2703
Gross surplus	246	238	483	157	266	2064	3315	1341	464	702
Indirect taxes on production	66	-121	194	83	32	338	945	268	114	195
Total gross output	**2954**	**853**	**8106**	**4115**	**1191**	**20862**	**65611**	**14008**	**4719**	**8777**
Value added at factor cost to output ratio	0.31	0.73	0.25	0.36	0.70	0.26	0.11	0.27	0.35	0.41
Share of wages and mixed income in value added	0.72	0.75	0.71	0.88	0.88	0.61	0.47	0.64	0.74	0.84
Employment to gross output ratio	9.47	8.14	3.93	4.97	12.42	9.00	5.46	6.20	4.50	10.59
Foreign ownership ratio	0.37	0.08	0.42	0.22	0.22	0.25	0.52	0.22	0.32	0.20
Direct tax rate on surplus	0.07	0.14	0.22	0.22	0.05	0.15	0.04	0.18	0.15	0.16
Indirect tax rate on production	0.05	0.07	0.06	0.03	0.03	0.03	0.03	0.04	0.05	0.04
Foreign income payout ratio	0.09	0.02	0.09	0.02	0.03	0.08	0.25	0.07	0.08	0.03
Replacement depreciation to value added ratio	0.27	0.19	0.23	0.14	0.11	0.14	0.32	0.07	0.10	0.08
Net national product ratio	0.63	0.79	0.67	0.84	0.87	0.77	0.43	0.86	0.83	0.89
Domestic income distribution ratio	0.16	0.20	0.13	0.08	0.09	0.25	0.23	0.24	0.16	0.12

Table B.1(g) Australia input-output flow table with direct allocation of imports – $2009m (continued)

	Motor vehicles and parts, other transport equipment	Ships and boats	Railway equipment	Aircraft	Photographic and scientific equipment	Electronic equipment	Household appliances	Other electrical equipment	Agricultural, mining, etc. machinery	Other machinery and equipment
Sheep	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grains	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Beef cattle	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dairy cattle	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Poultry	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other agriculture	0.00	0.00	0.00	0.00	0.25	0.04	0.04	0.17	0.00	0.21
Services to agriculture, hunting and trapping	0.00	0.00	0.00	0.00	0.03	1.11	0.00	6.68	0.00	0.00
Forestry and logging	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Commercial fishing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coal	1.88	0.06	0.01	0.04	0.21	0.35	0.08	0.09	0.07	1.17
Gas	24.14	4.36	1.41	25.75	6.21	3.26	4.51	4.91	9.62	4.83
LNG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Oil	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Iron ores	0.54	0.02	0.00	0.01	0.05	0.10	0.01	0.02	0.02	0.03
Non-ferrous metal ores	1.51	0.05	0.24	0.02	0.62	0.29	3.10	38.76	6.98	0.99
Other mining	0.15	0.06	0.03	0.20	0.35	0.05	0.17	1.61	0.10	0.18
Services to mining	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Meat and meat products	4.02	0.58	0.14	1.47	0.74	0.65	1.54	0.74	1.05	0.92
Dairy products	5.17	2.00	0.08	1.68	1.26	0.78	1.01	0.66	0.78	1.05
Fruit and vegetable products	3.65	0.88	0.28	1.68	0.55	0.59	0.76	0.58	0.69	1.58
Oils and fats	1.46	0.40	0.06	0.32	0.21	0.21	0.25	0.21	0.25	0.28
Flour mill products and cereal foods	4.18	0.66	0.16	0.89	0.68	0.72	0.84	0.71	0.84	0.92
Bakery products	3.84	0.75	0.13	0.73	0.59	0.68	0.80	0.67	0.81	1.11
Confectionery	3.65	1.05	0.12	0.82	0.48	0.52	0.60	0.51	0.60	0.66
Other food products	9.71	1.90	0.47	2.26	17.70	1.90	2.60	2.06	3.25	3.42
Soft drinks, cordials and syrups	0.71	0.10	0.03	0.17	0.13	0.11	0.12	0.11	0.12	0.14
Beer and malt	0.95	0.16	0.03	4.17	0.11	0.12	0.16	0.15	0.18	0.23
Wine, spirits and tobacco products	1.51	0.61	0.17	2.83	0.96	0.38	0.63	0.49	0.66	0.88
Textile fibres, yarns and woven fabrics	7.82	1.63	0.42	0.74	1.12	0.53	1.32	0.70	1.53	1.48
Textile products	1.76	2.37	0.41	0.73	1.45	1.47	1.44	3.16	1.57	3.13
Knitting mill products	1.78	0.47	0.07	0.35	0.34	0.27	0.34	0.27	0.32	0.35

Table B.1(g) Australia input-output flow table with direct allocation of imports – $2009m (continued)

	Motor vehicles and parts, other transport equipment	Ships and boats	Railway equipment	Aircraft	Photographic and scientific equipment	Electronic equipment	Household appliances	Other electrical equipment	Agricultural, mining, etc. machinery	Other machinery and equipment
Clothing	12.80	1.91	0.66	2.25	2.41	1.85	2.93	2.30	3.87	2.25
Footwear	1.80	0.42	0.16	0.86	0.53	0.32	0.43	0.32	0.40	0.46
Leather and leather products	3.18	0.32	0.29	0.48	1.73	0.37	0.52	0.49	0.70	0.39
Sawmill products	5.86	4.58	0.21	0.70	1.32	1.03	1.38	1.65	1.83	1.54
Other wood products	24.60	97.68	2.72	5.61	4.78	2.07	6.75	3.90	8.07	10.59
Pulp, paper and paperboard	2.41	0.81	0.28	1.08	2.13	0.74	2.16	0.76	0.55	1.67
Paper containers and products	12.95	1.51	0.50	3.04	12.77	4.21	20.71	3.78	3.86	4.82
Printing and services to printing	50.86	7.41	1.20	3.84	12.58	6.04	17.92	16.38	24.78	29.08
Publishing, recorded media, etc.	32.09	4.19	0.63	4.08	6.44	15.20	11.66	10.68	10.68	9.64
Petroleum and coal products	27.81	22.80	4.39	5.92	6.61	3.07	6.01	6.28	15.33	28.85
Basic chemicals	124.74	15.74	4.41	6.05	71.67	10.16	51.58	128.17	6.90	11.55
Paints	57.09	14.75	0.55	3.69	1.29	0.55	8.07	1.94	4.29	5.98
Medicinal and pharmaceutical products, pesticides	6.18	0.82	0.22	1.19	2.44	0.92	1.12	0.96	1.03	1.12
Soap and detergents	2.11	0.26	0.16	0.35	0.88	0.23	0.32	0.45	0.30	0.37
Cosmetics and toiletry preparations	0.40	0.08	0.02	0.11	0.06	0.05	0.10	0.06	0.07	0.08
Other chemical products	9.65	1.75	2.04	2.34	13.39	0.79	3.33	1.63	2.80	3.37
Rubber products	31.70	2.38	1.58	0.30	3.66	1.29	6.95	2.53	3.01	10.66
Plastic products	105.54	5.66	5.41	4.57	83.76	30.27	48.17	32.41	20.32	33.64
Glass and glass products	157.23	16.62	6.72	4.84	3.07	1.31	26.92	9.47	7.08	6.73
Ceramic products	2.46	0.18	0.86	0.99	0.83	0.50	1.79	1.94	2.78	1.62
Cement, lime and concrete slurry	11.86	2.05	1.18	2.50	4.50	1.26	10.13	1.39	6.24	12.87
Plaster and other concrete products	6.48	1.98	1.88	2.08	2.57	0.90	1.44	1.66	2.64	3.81
Other non-metallic mineral products	9.03	6.27	3.14	3.23	6.12	1.53	2.44	1.62	3.96	3.32
Iron and steel	948.29	292.57	84.49	14.28	158.91	35.60	586.40	158.45	731.01	881.53
Basic non-ferrous metal and products	537.71	254.17	27.41	73.46	616.39	124.15	142.68	1588.34	93.03	219.09
Structural metal products	79.40	68.70	139.13	5.66	26.86	12.54	27.47	104.41	117.13	243.02
Sheet metal products	88.41	15.79	6.97	38.12	13.27	4.83	97.24	18.68	58.35	105.25
Fabricated metal products	161.52	49.43	20.71	67.42	26.92	14.68	56.20	49.59	76.60	96.91
Motor vehicles and parts, other transport equipment	1240.96	15.20	6.98	41.18	17.34	6.47	27.51	9.68	45.91	18.04
Ships and boats	6.46	10.35	0.49	3.11	0.71	0.42	0.55	0.82	2.39	1.22
Railway equipment	13.22	0.44	322.99	0.40	0.73	0.94	3.39	2.21	1.44	3.39
Aircraft	1.59	1.70	0.03	489.32	0.05	0.05	0.06	0.07	0.39	0.06

Table B.1(g) Australia input-output flow table with direct allocation of imports – $2009m (continued)

	Motor vehicles and parts, other transport equipment	Ships and boats	Railway equipment	Aircraft	Photographic and scientific equipment	Electronic equipment	Household appliances	Other electrical equipment	Agricultural, mining, etc. machinery	Other machinery and equipment
Photographic and scientific equipment	9.98	123.04	1.22	15.01	9.09	7.43	14.52	8.85	11.72	10.24
Electronic equipment	16.57	10.64	3.46	24.05	30.63	50.23	26.67	21.99	17.50	24.86
Household appliances	28.78	9.50	1.18	2.80	3.20	2.57	95.48	5.43	8.45	6.61
Other electrical equipment	33.79	14.76	10.17	16.47	69.07	59.28	230.96	255.74	74.23	114.12
Agricultural, mining, etc. machinery	58.58	87.82	8.11	9.96	4.20	6.41	7.18	9.84	47.25	31.18
Other machinery and equipment	84.61	74.84	14.15	15.36	10.12	14.33	40.88	27.46	71.17	83.36
Prefabricated buildings	1.86	1.38	1.63	0.26	0.31	0.28	0.63	1.51	1.43	2.58
Furniture	10.42	30.87	1.22	2.29	1.61	1.94	2.58	2.89	5.19	5.37
Other manufacturing	28.78	12.29	7.04	5.85	9.58	5.36	19.14	12.26	12.24	22.09
Electricity supply	238.06	32.64	13.41	1.60	27.95	116.63	52.53	54.39	67.84	98.40
Gas supply	16.27	2.36	1.15	18.71	3.55	2.88	3.75	3.93	4.66	3.93
Water supply, sewerage and drainage services	40.68	3.17	0.92	0.00	4.26	7.85	9.31	5.34	12.15	18.66
Residential building	19.38	2.50	1.02	0.07	4.84	1.78	2.94	1.63	2.20	2.46
Other construction	26.22	3.39	1.38	0.10	6.54	2.41	3.97	2.21	2.98	3.33
Construction trade services	62.24	37.43	17.35	7.77	47.69	16.13	26.56	17.54	23.10	29.43
Wholesale trade	1976.45	321.92	77.63	422.63	335.53	352.18	407.21	392.76	411.13	448.39
Wholesale mechanical repairs	129.75	0.00	0.00	0.00	0.09	0.07	0.07	0.22	0.59	0.97
Other wholesale repairs	61.14	7.46	0.83	0.00	5.16	4.54	1.78	5.01	44.00	42.61
Retail trade	208.36	22.50	4.85	31.59	41.52	27.29	27.63	27.87	31.23	31.47
Retail mechanical repairs	13.58	3.96	0.07	0.00	1.39	1.15	1.09	3.43	9.31	15.47
Other retail repairs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Accommodation, cafes and restaurants	81.73	9.50	2.63	0.00	28.36	21.44	17.06	8.30	18.18	17.31
Road transport	186.29	43.54	12.71	30.17	63.53	30.76	90.79	56.60	74.37	87.08
Rail, pipeline and other transport	18.77	1.63	0.55	4.89	4.01	1.69	4.87	2.85	13.80	28.89
Water transport	6.26	0.44	0.38	0.26	3.56	0.70	3.57	3.40	9.43	7.03
Air and space transport	33.98	6.90	0.32	0.99	13.89	10.51	18.55	14.24	30.57	25.43
Services to transport, storage	276.44	61.10	11.35	2.81	18.45	10.63	16.45	25.22	28.25	50.17
Communication services	137.83	31.82	8.41	0.00	60.22	33.99	67.30	60.93	102.34	165.98
Finance	229.53	29.86	13.91	18.11	38.92	40.23	38.08	42.80	55.57	49.08
Ownership of dwellings	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other property services	1179.65	36.93	2.08	13.01	38.31	28.13	20.76	28.56	47.95	70.37
Scientific research, technical and computer services	738.74	19.33	13.09	0.00	155.22	226.63	310.89	165.78	165.05	108.54

Table B.1(g) Australia input-output flow table with direct allocation of imports – $2009m (continued)

	Motor vehicles and parts, other transport equipment	Ships and boats	Railway equipment	Aircraft	Photographic and scientific equipment	Electronic equipment	Household appliances	Other electrical equipment	Agricultural, mining, etc. machinery	Other machinery and equipment
Legal, accounting, marketing and business management services	254.06	51.78	7.33	0.00	189.08	33.45	72.99	55.18	93.65	176.05
Other business services	740.23	43.30	1.30	0.00	121.42	87.01	204.31	93.89	197.87	139.98
Government administration	57.69	6.57	0.73	0.00	4.11	1.84	4.91	3.02	6.07	4.29
Defence	0.80	0.03	0.02	0.00	0.30	0.20	0.20	0.10	0.17	0.13
Education	43.85	5.05	1.60	0.00	13.28	12.56	15.67	9.25	17.18	16.36
Health services	29.00	0.65	0.01	0.00	0.36	0.55	0.41	0.40	0.52	0.65
Community services	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Motion picture, radio and television services	178.76	0.00	0.00	0.00	5.41	1.98	17.85	9.19	3.87	1.85
Libraries, museums and the arts	2.39	0.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sport, gambling and recreational services	0.24	0.03	0.01	0.00	0.09	0.06	0.05	0.02	0.05	0.05
Personal services	3.64	1.20	0.01	0.00	2.49	2.51	0.46	0.25	0.31	0.45
Other services	17.45	1.59	0.28	0.00	3.04	1.56	3.41	1.26	2.76	2.68
Total intermediate usage including imports	**14123**	**3107**	**1520**	**2799**	**3590**	**2244**	**4368**	**4814**	**4151**	**5181**
Wages and salaries	3199	1020	642	1196	1637	1614	642	1303	1748	2023
Gross surplus	2743	127	22	-31	60	296	441	649	477	589
Indirect taxes on production	532	94	45	119	104	138	110	159	153	147
Total gross output	**20597**	**4349**	**2229**	**4083**	**5390**	**4293**	**5562**	**6925**	**6529**	**7940**
Value added at factor cost to output ratio	0.31	0.29	0.32	0.31	0.33	0.48	0.21	0.30	0.36	0.35
Share of wages and mixed income in value added	0.54	0.96	1.06	1.09	1.03	0.82	0.59	0.67	0.80	0.80
Employment to gross output ratio	11.17	3.67	4.05	4.16	10.70	10.96	8.62	9.89	10.97	10.94
Foreign ownership ratio	0.50	0.40	0.50	0.50	0.30	0.20	0.18	0.13	0.80	0.42
Direct tax rate on surplus	0.07	0.75	0.75	-0.03	1.98	0.42	0.07	0.15	0.31	0.28
Indirect tax rate on production	0.06	0.05	0.04	0.07	0.03	0.06	0.05	0.05	0.04	0.03
Foreign income payout ratio	0.19	0.01	0.00	0.00	0.00	0.03	0.07	0.04	0.14	0.08
Replacement depreciation to value added ratio	0.24	0.07	0.05	0.27	0.12	0.08	0.09	0.07	0.07	0.08
Net national product ratio	0.57	0.91	0.95	0.73	0.88	0.89	0.85	0.89	0.80	0.85
Domestic income distribution ratio	0.19	0.02	0.00	0.00	0.00	0.12	0.31	0.25	0.03	0.11

Table B.1(h) Australia input-output flow table with direct allocation of imports – $2009m (continued)

	Pre-fabricated buildings	Furniture	Other manufacturing	Electricity supply	Gas supply	Water supply, sewerage and drainage services	Residential building	Other construction	Construction trade services	Wholesale trade
Sheep	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	77.64
Grains	0.05	0.05	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Beef cattle	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	63.83
Dairy cattle	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.00	0.55
Pigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	36.55
Poultry	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	44.20
Other agriculture	0.17	0.53	19.27	0.88	0.00	6.51	23.93	93.58	15.49	9.17
Services to agriculture, hunting and trapping	0.00	0.25	34.95	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Forestry and logging	0.03	19.34	0.65	1.90	0.00	0.00	1.61	56.86	6.77	0.00
Commercial fishing	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.18	0.00	0.00
Coal	0.00	0.00	0.00	3017.38	5.90	0.99	2.82	8.51	2.49	10.64
Gas	2.43	7.18	9.06	1797.48	0.00	0.00	2.76	8.63	2.43	3624.98
LNG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Oil	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Iron ores	0.00	0.00	0.01	0.93	0.27	0.04	1.22	3.57	1.07	4.06
Non-ferrous metal ores	0.00	0.21	0.03	6.07	0.73	0.60	3.41	11.35	2.98	554.21
Other mining	0.03	0.02	6.24	0.47	0.12	12.02	107.66	336.14	159.21	1.96
Services to mining	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Meat and meat products	0.10	0.56	7.73	0.93	0.11	2.55	7.36	23.41	8.19	222.65
Dairy products	0.26	1.36	1.43	2.33	0.10	10.10	12.03	21.75	6.20	55.82
Fruit and vegetable products	0.08	0.51	0.50	0.93	0.15	0.78	4.60	8.17	4.10	7.00
Oils and fats	0.03	0.21	0.20	0.72	0.10	1.23	2.96	5.12	2.04	5.53
Flour mill products and cereal foods	0.10	0.62	0.61	1.04	0.12	0.80	4.42	7.35	4.66	4.61
Bakery products	0.08	0.48	0.48	2.43	1.40	3.20	3.95	6.56	3.92	11.00
Confectionery	0.08	0.52	0.46	1.18	0.08	2.13	6.61	11.39	4.53	9.06
Other food products	1.15	2.37	5.46	3.61	0.85	3.47	26.15	41.32	16.31	32.21
Soft drinks, cordials and syrups	0.02	0.09	0.13	0.19	0.02	0.14	4.33	6.01	0.86	1.79
Beer and malt	0.02	0.12	0.12	0.20	0.02	0.36	2.63	3.77	1.69	9.00
Wine, spirits and tobacco products	0.24	0.47	1.32	0.45	0.13	3.92	5.44	7.99	3.92	20.32
Textile fibres, yarns and woven fabrics	0.12	10.11	1.78	0.75	0.31	0.96	10.50	19.36	12.88	11.86
Textile products	0.77	7.75	11.13	0.86	0.12	0.47	34.10	55.24	23.28	9.22
Knitting mill products	0.06	7.08	2.85	0.54	0.06	0.28	5.44	8.70	2.74	9.93
Clothing	0.50	3.32	2.82	3.71	0.42	1.70	10.06	18.05	9.97	18.81

Table B.1(h) Australia input-output flow table with direct allocation of imports – $2009m (continued)

	Pre-fabricated buildings	Furniture	Other manufacturing	Electricity supply	Gas supply	Water supply, sewerage and drainage services	Residential building	Other construction	Construction trade services	Wholesale trade
Footwear	0.13	0.41	1.44	3.01	0.13	0.51	2.66	7.36	2.98	5.19
Leather and leather products	0.13	5.63	51.53	0.55	0.99	0.42	3.46	7.31	4.71	6.00
Sawmill products	23.87	500.93	44.41	0.81	0.15	1.53	804.82	137.05	742.35	16.37
Other wood products	38.01	351.66	49.68	3.91	0.56	29.34	1664.80	423.85	1350.10	231.96
Pulp, paper and paperboard	0.47	6.60	4.24	1.81	0.09	0.30	35.44	55.15	10.19	34.50
Paper containers and products	0.84	6.38	5.18	12.81	1.32	5.73	126.54	198.98	33.05	244.40
Printing and services to printing	2.31	13.23	18.84	33.90	8.51	14.66	152.72	375.26	55.19	1021.94
Publishing, recorded media, etc.	1.74	6.49	8.76	13.30	2.81	11.55	56.53	116.62	23.66	469.77
Petroleum and coal products	2.16	7.18	8.13	390.97	3.70	188.32	186.34	398.33	360.74	512.03
Basic chemicals	2.73	30.44	55.10	35.94	15.30	96.86	241.00	635.34	404.98	86.63
Paints	1.84	23.84	18.84	8.53	0.93	15.20	112.63	121.71	155.04	11.54
Medicinal and pharmaceutical products, pesticides	0.49	1.71	3.10	6.10	3.36	41.43	10.87	45.50	30.44	44.04
Soap and detergents	0.08	0.90	2.20	3.19	0.98	6.01	2.65	10.35	6.32	23.04
Cosmetics and toiletry preparations	0.03	0.14	0.14	0.17	0.04	0.24	0.90	2.24	1.26	2.61
Other chemical products	1.39	15.09	7.13	4.12	1.07	3.93	82.64	215.26	169.33	28.68
Rubber products	0.23	5.93	10.52	10.85	1.22	1.40	16.05	37.38	16.07	15.23
Plastic products	3.17	68.41	163.38	11.69	29.03	44.59	686.62	910.51	528.20	221.76
Glass and glass products	6.74	34.95	7.38	2.46	0.47	3.09	122.26	143.77	75.18	264.14
Ceramic products	0.42	0.92	0.87	5.61	0.40	5.64	286.71	28.46	183.62	5.26
Cement, lime and concrete slurry	0.77	1.10	3.95	40.19	1.02	85.20	1442.16	2268.57	2051.67	10.39
Plaster and other concrete products	2.14	13.15	4.87	98.02	0.30	4.95	1247.73	776.93	1203.20	22.04
Other non-metallic mineral products	1.17	3.11	6.80	7.12	1.37	8.30	207.53	228.09	230.54	26.17
Iron and steel	104.17	168.01	274.12	30.05	13.26	44.24	837.47	2236.45	1161.22	147.99
Basic non-ferrous metal and products	83.51	249.01	598.38	20.57	6.98	24.57	636.73	492.96	278.11	63.46
Structural metal products	55.00	42.51	93.36	44.35	7.41	84.69	3027.96	3216.94	1450.53	77.75
Sheet metal products	5.96	15.01	22.42	3.73	21.00	7.43	275.29	433.92	189.19	135.96
Fabricated metal products	23.09	63.61	45.23	58.40	36.72	118.84	495.20	1184.73	479.64	123.63
Motor vehicles and parts, other transport equipment	2.80	13.78	55.27	14.92	1.46	11.82	122.76	214.53	155.03	159.31
Ships and boats	0.17	0.32	0.49	1.26	0.39	0.83	72.79	108.94	34.95	80.95
Railway equipment	0.02	0.91	0.87	2.98	0.08	0.22	5.84	9.57	4.07	4.02
Aircraft	0.01	0.03	0.24	0.48	0.02	0.11	14.87	23.23	7.02	121.36
Photographic and scientific equipment	0.24	1.44	3.68	14.80	0.35	4.32	16.23	88.40	20.88	39.01
Electronic equipment	1.42	1.93	4.70	22.15	1.06	9.75	45.82	271.54	137.05	23.66

Table B.1(h) Australia input-output flow table with direct allocation of imports – $2009m (continued)

	Pre-fabricated buildings	Furniture	Other manufacturing	Electricity supply	Gas supply	Water supply, sewerage and drainage services	Residential building	Other construction	Construction trade services	Wholesale trade
Household appliances	0.18	1.68	2.85	5.79	0.37	2.12	462.97	263.01	230.32	15.50
Other electrical equipment	1.73	5.10	12.07	399.50	1.61	13.97	170.77	1299.73	401.27	110.60
Agricultural, mining, etc. machinery	0.69	1.35	5.59	22.96	0.92	4.25	72.54	131.66	144.71	36.96
Other machinery and equipment	1.62	7.68	7.79	30.62	5.03	22.57	126.39	444.89	150.03	78.97
Prefabricated buildings	1.03	0.74	0.82	0.43	0.06	0.59	49.86	142.46	36.62	3.93
Furniture	7.00	21.66	3.91	2.42	0.39	14.88	279.97	214.42	231.97	41.11
Other manufacturing	4.20	18.39	35.76	19.02	7.90	10.00	201.35	413.32	364.40	143.34
Electricity supply	1.47	23.17	33.57	4827.31	5.92	282.16	104.04	510.88	83.52	629.05
Gas supply	1.92	5.55	7.33	585.29	0.00	0.99	28.27	6.10	10.87	241.42
Water supply, sewerage and drainage services	0.26	3.91	5.28	97.68	19.28	436.75	304.70	173.35	72.58	251.48
Residential building	0.18	0.68	1.24	160.25	82.17	62.56	1426.15	1976.41	2201.08	271.33
Other construction	0.25	0.91	1.67	230.25	111.09	86.27	2060.11	2681.58	2984.62	434.89
Construction trade services	2.31	6.96	13.39	2220.62	815.06	950.43	11408.93	13437.05	34415.77	1814.01
Wholesale trade	52.88	297.28	306.59	550.84	49.44	449.78	2181.57	3724.59	2502.70	2741.35
Wholesale mechanical repairs	0.09	0.42	0.18	67.54	31.76	36.10	101.58	216.97	59.17	58.03
Other wholesale repairs	4.90	30.34	19.14	147.54	163.60	52.18	130.66	178.25	65.25	579.01
Retail trade	4.94	44.43	94.23	70.91	12.16	39.88	243.68	626.68	275.68	1132.59
Retail mechanical repairs	6.25	24.39	29.37	234.72	47.87	61.64	178.14	502.70	895.85	983.25
Other retail repairs	0.00	0.00	0.00	0.00	0.00	0.00	13.53	22.77	13.07	30.94
Accommodation, cafes and restaurants	4.84	16.71	24.36	122.48	11.67	33.58	38.76	49.67	12.43	579.98
Road transport	13.32	105.45	102.28	164.16	11.44	100.55	947.47	1437.57	1065.81	1141.59
Rail, pipeline and other transport	0.78	3.03	5.29	271.92	2.07	1.07	62.45	115.20	28.30	119.07
Water transport	0.33	1.36	10.01	48.19	13.87	0.29	2.68	6.36	4.19	85.85
Air and space transport	1.47	4.65	5.44	58.93	19.46	29.85	88.59	94.80	23.54	960.80
Services to transport, storage	1.93	20.57	51.35	51.73	2.77	24.67	340.74	3216.56	388.10	9969.41
Communication services	5.48	39.23	76.67	348.59	86.62	143.56	644.46	1482.10	251.68	3116.56
Finance	9.81	43.71	38.38	1313.33	197.77	722.21	3454.88	3401.09	4318.10	3141.12
Ownership of dwellings	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other property services	1.55	18.79	39.26	391.96	312.37	5.11	2745.85	6598.09	2147.70	8405.65
Scientific research, technical and computer services	8.79	25.09	17.42	248.89	51.90	28.04	253.43	6225.46	746.88	1398.42
Legal, accounting, marketing and business management services	3.99	76.50	97.04	316.29	971.67	693.63	1794.49	5040.22	2410.66	5356.98
Other business services	13.98	101.11	74.39	223.77	369.80	101.27	954.49	2917.96	1293.09	1504.10

Table B.1(h) Australia input-output flow table with direct allocation of imports – $2009m (continued)

	Pre-fabricated buildings	Furniture	Other manufacturing	Electricity supply	Gas supply	Water supply, sewerage and drainage services	Residential building	Other construction	Construction trade services	Wholesale trade
Government administration	0.43	3.28	2.62	19.07	1.65	38.65	263.71	480.88	83.84	121.97
Defence	0.01	0.07	0.07	0.09	0.00	0.00	0.67	0.73	0.14	8.58
Education	0.48	3.35	3.31	160.64	26.71	25.69	46.29	42.02	10.32	33.03
Health services	0.08	0.27	0.59	1.17	0.00	3.61	0.21	7.13	0.05	12.91
Community services	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Motion picture, radio and television services	1.97	8.26	1.78	13.38	17.43	20.31	46.26	28.59	15.71	285.24
Libraries, museums and the arts	0.50	12.85	1.19	38.49	56.88	50.38	40.11	7.05	0.88	51.48
Sport, gambling and recreational services	0.01	0.05	0.07	0.37	0.03	0.09	227.26	349.43	126.74	158.71
Personal services	0.03	0.60	0.28	0.76	0.00	1.60	15.15	56.23	6.02	18.62
Other services	0.26	1.36	1.26	8.80	0.00	4.59	141.07	448.76	62.11	13.91
Total intermediate usage including imports	**698**	**3597**	**4012**	**20752**	**3980**	**6704**	**48434**	**83660**	**74435**	**62975**
Wages and salaries	194	1447	872	4350	182	3434	4084	13387	21745	30714
Gross surplus	136	485	49	12228	922	6065	7436	19748	17410	18696
Indirect taxes on production	20	125	75	1012	106	20	1053	1768	1902	4578
Total gross output	**1048**	**5654**	**5009**	**38342**	**5189**	**16223**	**61006**	**118564**	**115491**	**116963**
Value added at factor cost to output ratio	0.33	0.36	0.20	0.46	0.23	0.59	0.21	0.29	0.36	0.46
Share of wages and mixed income in value added	0.61	0.94	1.30	0.25	0.16	0.39	0.43	0.48	0.97	0.64
Employment to gross output ratio	7.58	24.25	12.46	2.99	8.42	4.33	4.93	7.08	14.89	7.33
Foreign ownership ratio	0.03	0.05	0.07	0.40	0.30	0.01	0.05	0.15	0.05	0.35
Direct tax rate on surplus	0.16	0.10	0.16	0.01	0.02	0.01	0.07	0.06	0.08	0.23
Indirect tax rate on production	0.03	0.04	0.02	0.04	0.05	-0.01	0.05	0.03	0.02	0.08
Foreign income payout ratio	0.01	0.00	0.00	0.27	0.23	0.01	0.03	0.07	0.00	0.10
Replacement depreciation to value added ratio	0.21	0.08	0.07	0.35	0.35	0.29	0.03	0.02	0.06	0.08
Net national product ratio	0.78	0.92	0.93	0.38	0.42	0.71	0.95	0.91	0.94	0.82
Domestic income distribution ratio	0.32	0.05	0.00	0.41	0.53	0.59	0.49	0.42	0.03	0.19

Table B.1(i) Australia input-output flow table with direct allocation of imports – $2009m (continued)

	Wholesale mechanical repairs	Other wholesale repairs	Retail trade	Retail mechanical repairs	Other retail repairs	Accommodation, cafes and restaurants	Road transport	Rail, pipeline and other transport	Water transport	Air and space transport
Sheep	0.00	0.00	502.50	0.00	0.00	181.44	0.00	0.00	0.00	0.00
Grains	0.00	0.00	0.04	0.00	0.00	0.02	0.00	0.00	0.00	0.00
Beef cattle	0.00	0.00	413.05	0.00	0.00	149.45	0.00	0.00	0.00	0.00
Dairy cattle	0.00	0.00	3.59	0.00	0.00	1.31	0.00	0.00	0.00	0.00
Pigs	0.00	0.00	236.53	0.00	0.00	85.58	0.00	0.00	0.00	0.00
Poultry	0.00	0.00	310.29	0.00	0.00	134.42	0.00	0.00	0.00	0.00
Other agriculture	0.00	0.86	318.37	2.96	0.36	482.42	0.77	1.27	0.00	0.00
Services to agriculture, hunting and trapping	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Forestry and logging	0.00	0.00	1.34	0.00	0.00	0.65	3.47	14.34	0.00	0.00
Commercial fishing	0.00	0.00	190.81	0.00	0.00	142.71	0.00	0.00	0.00	0.00
Coal	0.04	1.90	9.97	0.49	0.02	2.40	1.97	9.87	0.99	0.99
Gas	0.84	5.34	115.00	7.57	1.16	167.93	12.48	34.52	0.00	2.86
LNG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Oil	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Iron ores	0.02	0.81	1.90	0.21	0.01	1.01	0.56	0.89	0.01	0.29
Non-ferrous metal ores	0.05	2.10	5.64	0.57	0.02	2.99	4.49	25.51	0.33	0.98
Other mining	0.01	0.39	0.46	0.09	0.00	3.67	0.26	0.92	0.00	0.14
Services to mining	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Meat and meat products	0.38	1.56	2613.99	7.05	0.21	1837.30	3.77	1.40	0.05	1.36
Dairy products	1.54	3.07	739.73	13.59	0.92	703.01	6.83	3.32	0.12	6.46
Fruit and vegetable products	0.39	1.69	213.73	3.12	0.20	215.58	3.13	0.32	0.09	1.53
Oils and fats	0.31	0.72	134.36	2.25	0.12	82.00	1.66	0.31	0.03	0.60
Flour mill products and cereal foods	0.44	1.80	719.60	3.72	0.24	383.44	3.73	0.36	0.06	1.62
Bakery products	0.37	1.53	430.33	3.09	0.20	401.24	3.68	1.25	1.50	3.98
Confectionery	0.55	1.65	175.99	4.38	0.28	225.87	3.41	0.73	0.04	1.28
Other food products	1.17	4.30	376.52	9.25	0.60	305.00	13.24	2.35	0.22	7.69
Soft drinks, cordials and syrups	0.07	0.28	423.16	0.55	0.05	99.17	0.86	0.35	0.01	0.33
Beer and malt	0.06	0.62	4.89	1.53	0.19	1550.84	2.28	0.69	0.01	1.84
Wine, spirits and tobacco products	0.10	1.40	5.17	3.09	1.14	902.16	4.61	1.52	0.04	4.36
Textile fibres, yarns and woven fabrics	0.44	1.15	19.88	7.24	0.14	6.36	4.70	0.69	0.08	0.75
Textile products	0.06	0.84	17.71	0.76	0.20	7.75	5.40	0.96	0.13	0.23
Knitting mill products	0.16	0.72	44.33	1.79	0.13	2.02	3.16	0.63	0.03	0.62
Clothing	17.02	5.17	18.56	51.44	1.16	10.84	8.55	2.27	0.20	3.78

Table B.1(i) Australia input-output flow table with direct allocation of imports – $2009m (continued)

	Wholesale mechanical repairs	Other wholesale repairs	Retail trade	Retail mechanical repairs	Other retail repairs	Accommodation, cafes and restaurants	Road transport	Rail, pipeline and other transport	Water transport	Air and space transport
Footwear	0.16	4.97	2.76	1.50	1.35	1.62	1.76	0.30	0.03	0.80
Leather and leather products	0.60	1.17	5.20	10.14	0.29	2.08	4.16	0.69	0.29	3.37
Sawmill products	0.29	1.37	28.60	2.43	0.17	2.98	12.12	2.10	0.39	1.82
Other wood products	2.62	3.03	143.12	9.63	0.50	15.76	36.78	5.08	1.17	4.82
Pulp, paper and paperboard	0.08	0.87	21.63	1.17	0.26	24.61	13.86	3.25	1.91	16.27
Paper containers and products	1.10	6.41	192.83	6.22	2.20	93.60	10.62	10.11	1.85	19.39
Printing and services to printing	4.35	6.96	1664.05	36.44	1.56	205.04	44.97	31.26	3.66	13.65
Publishing, recorded media, etc.	3.47	6.39	820.06	28.11	1.31	103.76	22.61	36.72	3.32	12.08
Petroleum and coal products	11.11	81.63	392.69	70.68	16.25	168.35	1466.79	146.92	58.79	2002.78
Basic chemicals	3.31	8.90	49.75	20.90	1.53	56.47	16.54	11.58	0.53	8.51
Paints	4.51	8.94	5.63	19.39	1.20	4.25	1.32	1.09	0.27	0.51
Medicinal and pharmaceutical products, pesticides	0.62	2.20	23.36	5.12	0.34	10.99	5.26	2.02	0.07	2.88
Soap and detergents	0.47	1.49	11.89	2.58	0.27	25.61	4.62	1.44	0.04	0.58
Cosmetics and toiletry preparations	0.06	0.14	1.27	0.37	0.03	0.85	0.31	0.29	0.01	0.13
Other chemical products	1.37	3.91	17.17	4.09	0.82	5.19	4.32	1.38	0.27	3.29
Rubber products	1.38	6.43	4.63	15.69	0.74	4.96	20.27	0.70	0.01	0.22
Plastic products	2.48	11.20	121.51	37.34	1.35	124.50	57.90	12.38	1.88	70.53
Glass and glass products	16.56	2.32	31.70	92.26	0.28	20.45	12.81	5.64	0.02	0.47
Ceramic products	0.06	0.52	5.09	0.63	0.09	1.66	1.34	0.20	0.01	0.21
Cement, lime and concrete slurry	0.34	1.35	22.66	2.14	0.36	1.85	2.43	0.63	0.08	1.05
Plaster and other concrete products	0.33	0.90	9.80	1.59	0.10	3.96	1.36	2.90	0.08	0.51
Other non-metallic mineral products	0.16	0.54	16.12	1.20	0.07	1.74	1.05	0.55	0.02	0.19
Iron and steel	4.78	13.41	75.88	44.09	2.19	9.40	16.60	84.05	0.36	1.62
Basic non-ferrous metal and products	2.97	9.16	90.75	23.58	2.15	30.98	22.03	17.62	0.41	6.80
Structural metal products	10.34	12.96	42.54	42.59	1.01	10.74	18.20	287.25	0.55	2.37
Sheet metal products	2.44	3.40	93.18	21.33	3.15	5.46	181.07	33.52	0.91	4.19
Fabricated metal products	17.19	44.45	137.20	69.57	9.33	36.40	35.98	36.89	1.43	13.74
Motor vehicles and parts, other transport equipment	66.20	18.73	167.17	1582.32	4.39	35.59	680.59	12.00	0.51	6.40
Ships and boats	4.49	1.87	3.41	3.81	0.31	3.28	2.09	1.64	203.12	0.78
Railway equipment	1.55	2.05	4.48	4.53	0.13	1.78	6.04	1156.96	0.04	0.41
Aircraft	0.11	1.49	43.00	2.58	0.35	2.88	0.97	0.55	0.04	1368.70
Photographic and scientific equipment	3.24	27.49	16.77	13.05	2.47	12.76	8.64	4.11	0.79	17.10
Electronic equipment	4.83	101.24	11.21	15.96	5.61	18.32	13.67	4.41	0.81	15.73

Table B.1(i) Australia input-output flow table with direct allocation of imports – $2009m (continued)

	Wholesale mechanical repairs	Other wholesale repairs	Retail trade	Retail mechanical repairs	Other retail repairs	Accommodation, cafes and restaurants	Road transport	Rail, pipeline and other transport	Water transport	Air and space transport
Household appliances	4.07	41.41	28.73	17.89	108.99	43.90	16.05	8.17	0.59	12.31
Other electrical equipment	8.63	87.19	57.42	47.66	12.39	27.00	110.44	6.60	0.96	17.51
Agricultural, mining, etc. machinery	54.10	50.63	17.77	162.41	4.48	22.29	11.58	18.75	0.81	16.82
Other machinery and equipment	37.03	128.97	66.75	130.15	12.25	81.40	40.18	16.04	1.72	17.94
Prefabricated buildings	0.10	0.54	3.01	1.15	0.05	1.07	1.47	4.79	0.03	0.40
Furniture	0.89	3.27	39.80	6.32	0.39	38.34	18.10	3.57	0.12	2.86
Other manufacturing	3.69	31.46	136.75	75.26	5.92	85.95	17.01	15.98	0.42	5.53
Electricity supply	38.96	137.13	1018.69	228.00	44.40	780.66	194.40	360.15	52.31	39.47
Gas supply	0.89	3.07	115.31	7.28	1.23	147.08	6.91	12.83	2.96	2.96
Water supply, sewerage and drainage services	17.05	24.71	303.83	76.85	4.96	314.12	309.03	89.19	25.10	20.71
Residential building	10.35	69.98	123.85	21.14	1.12	78.29	46.82	40.52	1.16	14.90
Other construction	14.02	94.38	168.36	28.52	1.52	233.75	72.29	131.16	2.19	21.74
Construction trade services	144.95	185.97	598.79	119.23	16.06	793.76	112.48	781.56	5.83	30.93
Wholesale trade	210.08	913.10	1680.96	1765.04	118.91	1237.11	2245.13	167.52	42.01	1195.34
Wholesale mechanical repairs	1.06	0.00	326.59	0.00	0.00	0.50	34.92	8.08	15.45	0.00
Other wholesale repairs	0.00	0.00	715.52	0.00	0.00	26.65	125.69	32.81	51.54	77.35
Retail trade	13.15	55.31	2399.89	122.04	7.97	2584.89	330.52	43.24	3.03	383.65
Retail mechanical repairs	0.00	81.23	1145.36	0.00	13.68	37.94	3448.50	47.01	58.83	43.87
Other retail repairs	0.00	0.00	56.33	0.00	0.00	19.91	51.45	28.90	21.11	14.70
Accommodation, cafes and restaurants	1.41	9.76	345.67	22.33	4.91	54.01	160.29	15.26	6.35	39.00
Road transport	6.99	63.43	614.95	43.79	19.40	455.43	1310.11	69.91	6.06	223.35
Rail, pipeline and other transport	0.29	2.97	50.96	2.18	0.55	41.98	4.38	5.76	0.05	13.13
Water transport	0.09	3.65	35.73	0.46	0.03	4.95	4.40	0.32	136.02	0.14
Air and space transport	1.50	26.49	188.04	8.40	1.23	38.43	28.04	3.43	2.09	608.78
Services to transport, storage	17.07	28.68	819.74	89.70	7.58	309.37	657.77	55.87	779.88	1687.35
Communication services	59.06	238.08	3093.64	295.78	25.91	673.89	1010.35	54.95	16.80	136.18
Finance	88.29	224.03	2444.20	452.59	35.99	806.72	608.75	268.15	23.86	201.81
Ownership of dwellings	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other property services	16.70	752.39	3732.50	209.30	3.70	1624.62	1239.53	867.32	5.98	586.77
Scientific research, technical and computer services	2.20	15.87	437.73	1.50	0.03	337.05	940.88	52.59	82.82	311.62
Legal, accounting, marketing and business management services	112.86	257.39	6658.34	694.83	54.60	1109.93	2188.96	54.30	63.35	400.34
Other business services	112.29	647.25	3867.83	82.14	1.25	582.84	263.14	83.77	10.10	148.54

Table B.1(i) Australia input-output flow table with direct allocation of imports – $2009m (continued)

	Wholesale mechanical repairs	Other wholesale repairs	Retail trade	Retail mechanical repairs	Other retail repairs	Accommodation, cafes and restaurants	Road transport	Rail, pipeline and other transport	Water transport	Air and space transport
Government administration	8.41	8.76	180.14	54.25	2.72	12.60	488.72	16.75	0.91	1.62
Defence	0.00	0.00	2.55	0.00	0.00	3.08	7.92	0.39	0.11	0.67
Education	0.95	2.43	59.27	70.61	0.69	58.23	50.30	18.41	3.38	18.39
Health services	1.02	1.74	15.74	10.36	0.75	5.72	2.52	1.25	0.75	0.21
Community services	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Motion picture, radio and television services	1.33	1.13	1100.24	17.21	0.00	1201.12	63.12	0.82	2.77	18.34
Libraries, museums and the arts	0.00	0.00	74.09	10.96	0.00	176.12	30.36	12.70	17.21	34.47
Sport, gambling and recreational services	0.00	0.03	112.27	9.85	0.01	20.05	3.44	0.05	0.01	3.93
Personal services	0.68	0.58	54.93	4.40	0.00	21.05	0.66	1.29	0.00	0.00
Other services	0.00	0.00	21.74	5.28	0.00	6.74	18.56	0.82	0.00	0.00
Total intermediate usage including imports	**1697**	**6686**	**48333**	**9401**	**801**	**25751**	**22235**	**6070**	**2243**	**11196**
Wages and salaries	385	1445	28804	9540	1126	13483	11377	6018	461	4271
Gross surplus	264	396	18241	334	324	8547	8061	633	1177	894
Indirect taxes on production	77	360	3340	901	102	2747	2711	288	106	1573
Total gross output	**2423**	**8887**	**98718**	**20177**	**2354**	**50528**	**44384**	**13008**	**3987**	**17934**
Value added at factor cost to output ratio	0.30	0.25	0.51	0.53	0.66	0.49	0.50	0.53	0.44	0.38
Share of wages and mixed income in value added	0.60	0.75	0.68	1.05	0.85	0.62	0.72	0.88	0.29	0.66
Employment to gross output ratio	6.83	8.46	17.06	26.42	21.65	14.56	9.93	8.05	5.19	7.08
Foreign ownership ratio	0.15	0.20	0.10	0.04	0.04	0.09	0.20	0.02	0.40	0.38
Direct tax rate on surplus	0.25	0.25	0.13	0.36	0.01	0.04	0.04	0.10	0.04	0.39
Indirect tax rate on production	0.09	0.15	0.06	0.08	0.06	0.11	0.12	0.03	0.05	0.28
Foreign income payout ratio	0.05	0.04	0.03	0.00	0.01	0.03	0.05	0.00	0.26	0.06
Replacement depreciation to value added ratio	0.30	0.32	0.10	0.02	0.01	0.11	0.20	0.43	0.19	0.44
Net national product ratio	0.65	0.64	0.87	0.98	0.99	0.86	0.76	0.57	0.55	0.49
Domestic income distribution ratio	0.26	0.15	0.25	0.00	0.13	0.29	0.18	0.11	0.38	0.10

Table B.1(j) Australia input-output flow table with direct allocation of imports – $2009m (continued)

	Services to transport, storage	Commun-ication services	Finance	Ownership of dwellings	Other property services	Scientific research, technical and computer services	Legal, accounting, marketing and business management services	Other business services	Govern-ment admin-istration	Defence
Sheep	0.00	0.00	0.00	0.00	0.00	59.65	0.00	23.61	0.00	0.00
Grains	0.00	0.00	0.00	0.00	0.05	0.02	0.02	0.01	0.04	0.00
Beef cattle	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dairy cattle	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Poultry	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other agriculture	41.78	0.83	4.47	0.00	86.43	44.41	68.76	7.67	68.08	4.92
Services to agriculture, hunting and trapping	0.00	0.00	0.00	0.00	0.00	91.51	0.00	7.89	53.64	16.02
Forestry and logging	1.57	6.24	0.00	0.00	0.00	1.41	0.58	0.64	0.00	0.00
Commercial fishing	0.00	0.00	2.27	0.00	0.00	5.57	0.09	2.60	0.00	0.00
Coal	5.92	4.03	2.26	0.01	26.00	0.95	1.42	2.73	13.81	15.06
Gas	30.22	152.28	7.56	3.62	65.42	30.98	40.38	23.63	62.70	63.74
LNG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Oil	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Iron ores	1.71	1.72	0.95	0.00	10.45	0.39	0.60	1.16	1.50	1.11
Non-ferrous metal ores	8.00	4.93	2.66	0.01	40.41	1.23	1.71	3.33	48.55	54.88
Other mining	0.82	0.83	0.45	2.86	7.81	1.27	0.48	0.67	6.06	1.47
Services to mining	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Meat and meat products	3.61	20.06	9.22	1.24	18.22	41.00	34.20	18.85	3.00	10.77
Dairy products	10.03	73.75	10.59	0.38	20.61	108.77	22.56	47.58	3.26	4.28
Fruit and vegetable products	2.18	6.40	0.81	0.30	4.04	5.73	4.01	2.55	1.38	4.48
Oils and fats	1.36	5.27	0.31	0.13	2.46	7.52	4.33	2.08	1.21	1.42
Flour mill products and cereal foods	2.62	4.70	0.75	0.36	3.73	38.66	16.53	15.39	11.35	9.38
Bakery products	3.91	20.25	6.42	0.29	8.16	12.52	13.77	5.21	6.79	24.75
Confectionery	2.41	13.12	0.43	0.26	4.97	12.96	5.45	5.18	2.94	2.44
Other food products	12.08	24.25	6.05	23.29	17.05	57.84	26.92	22.19	25.12	27.46
Soft drinks, cordials and syrups	1.08	1.46	0.87	0.52	3.21	1.80	1.62	0.78	1.30	29.41
Beer and malt	3.44	2.34	3.74	0.62	3.54	3.16	1.96	1.40	5.46	3.25
Wine, spirits and tobacco products	11.14	11.12	32.94	0.80	9.49	5.58	4.03	2.70	84.13	4.39
Textile fibres, yarns and woven fabrics	2.07	12.87	0.69	1.75	4.43	4.17	1.91	1.80	4.73	5.55
Textile products	4.27	5.53	0.47	11.84	5.29	3.17	1.42	1.83	8.21	2.59
Knitting mill products	1.89	4.27	0.21	0.94	4.34	5.88	4.44	2.78	1.43	8.21

Table B.1(j) Australia input-output flow table with direct allocation of imports – $2009m (continued)

	Services to transport, storage	Commun-ication services	Finance	Ownership of dwellings	Other property services	Scientific research, technical and computer services	Legal, accounting, marketing and business management services	Other business services	Govern-ment admin-istration	Defence
Clothing	9.52	16.26	0.93	1.02	6.45	12.40	4.74	4.49	3.05	35.82
Footwear	1.51	2.64	0.19	0.30	1.64	1.37	0.87	0.66	0.63	1.94
Leather and leather products	2.03	3.48	0.46	0.57	1.35	1.85	1.90	1.50	1.03	6.63
Sawmill products	26.08	9.54	1.08	7.24	25.89	2.85	3.31	3.23	4.18	3.73
Other wood products	91.54	31.22	1.78	190.07	43.00	7.59	4.61	5.95	81.62	16.29
Pulp, paper and paperboard	3.39	93.68	26.39	1.08	9.07	13.84	37.76	8.81	122.58	4.90
Paper containers and products	7.36	33.88	3.19	0.27	9.45	16.69	10.71	5.55	57.23	6.15
Printing and services to printing	56.28	723.15	158.70	9.28	265.04	599.00	621.08	289.81	588.06	153.25
Publishing, recorded media, etc.	76.99	529.53	71.99	5.69	176.46	360.28	351.41	186.76	215.97	33.12
Petroleum and coal products	385.55	361.19	6.60	10.82	121.06	188.58	271.26	122.12	71.94	156.32
Basic chemicals	23.04	52.08	4.03	32.97	83.42	100.47	40.30	33.50	37.31	52.29
Paints	1.56	2.05	0.42	10.45	12.85	10.61	6.91	3.13	1.89	2.19
Medicinal and pharmaceutical products, pesticides	18.49	8.85	1.25	3.48	40.91	58.48	12.56	13.27	2.88	4.24
Soap and detergents	3.34	5.48	0.48	1.26	18.76	28.24	36.38	12.51	6.75	5.69
Cosmetics and toiletry preparations	0.41	0.61	0.05	0.45	1.60	0.68	0.61	0.35	0.43	0.79
Other chemical products	3.21	15.28	0.82	3.98	19.13	28.34	25.48	12.68	17.23	55.05
Rubber products	6.31	8.79	0.16	1.57	2.32	6.20	1.41	1.76	27.39	48.76
Plastic products	68.24	325.88	3.07	91.85	26.62	42.83	8.80	10.33	53.41	54.74
Glass and glass products	4.92	12.12	4.26	30.51	10.30	5.37	3.28	2.42	11.58	6.16
Ceramic products	1.49	29.17	0.24	3.14	2.52	1.66	0.76	0.82	1.18	0.78
Cement, lime and concrete slurry	2.03	9.98	1.01	56.51	8.93	12.82	2.26	6.57	4.71	3.18
Plaster and other concrete products	1.23	8.79	0.26	23.73	4.21	2.33	1.35	1.22	23.81	3.47
Other non-metallic mineral products	1.72	7.03	0.14	18.96	3.78	2.70	1.89	1.71	3.19	3.72
Iron and steel	7.91	62.75	1.73	163.75	17.20	19.18	5.76	4.50	15.89	31.22
Basic non-ferrous metal and products	20.96	80.45	7.13	141.40	62.12	24.68	20.03	15.81	41.61	41.90
Structural metal products	19.84	36.78	2.23	246.70	50.63	8.12	4.99	6.32	25.64	27.92
Sheet metal products	32.86	281.97	0.98	58.29	21.68	3.92	1.70	2.71	7.85	10.72
Fabricated metal products	19.21	86.39	5.54	67.09	56.49	56.78	17.43	15.96	50.95	117.27
Motor vehicles and parts, other transport equipment	110.92	187.51	7.04	3.82	97.83	46.03	22.23	19.25	21.43	94.20
Ships and boats	10.02	3.32	1.78	1.05	8.77	6.13	2.99	3.04	4.63	2066.14
Railway equipment	2.96	4.74	1.29	1.41	6.03	3.02	1.34	1.06	2.63	2.31
Aircraft	298.89	2.08	0.28	0.95	4.73	6.58	1.93	2.42	1.33	188.16

Table B.1(j) Australia input-output flow table with direct allocation of imports – $2009m (continued)

	Services to transport, storage	Commun-ication services	Finance	Ownership of dwellings	Other property services	Scientific research, technical and computer services	Legal, accounting, marketing and business management services	Other business services	Govern-ment admin-istration	Defence
Photographic and scientific equipment	39.36	94.93	3.29	4.12	30.34	60.23	15.50	12.36	18.83	63.41
Electronic equipment	163.18	270.11	5.80	13.46	37.22	84.53	41.60	20.35	15.25	21.59
Household appliances	17.97	20.07	1.76	33.06	19.03	10.29	5.84	4.61	3.65	20.10
Other electrical equipment	91.06	422.30	9.05	21.99	48.75	82.80	28.67	16.35	26.77	28.73
Agricultural, mining, etc. machinery	34.27	38.91	2.61	6.33	35.69	41.03	10.80	9.82	12.33	21.30
Other machinery and equipment	39.20	74.82	3.29	9.41	46.59	81.17	11.87	13.05	22.64	110.05
Prefabricated buildings	1.48	2.50	0.21	2.77	4.98	0.75	0.49	0.69	1.70	11.79
Furniture	10.25	26.68	6.43	30.05	52.66	13.63	14.06	22.13	68.50	40.41
Other manufacturing	24.93	76.65	4.11	13.35	47.34	34.47	20.52	16.07	18.07	32.94
Electricity supply	969.82	451.80	183.87	55.05	494.35	408.86	654.97	375.06	460.26	96.99
Gas supply	25.66	81.30	8.88	4.06	27.96	23.66	40.15	18.86	22.24	3.20
Water supply, sewerage and drainage services	307.59	289.88	89.89	5.36	841.35	667.32	631.30	414.66	283.62	140.94
Residential building	128.46	212.35	94.93	140.75	412.45	132.00	184.91	93.44	124.79	53.29
Other construction	269.60	293.34	127.52	261.56	606.92	181.06	271.50	127.48	273.64	185.80
Construction trade services	607.59	2469.77	68.67	1690.46	850.93	378.13	510.40	239.50	1487.62	1600.03
Wholesale trade	1057.69	2233.56	147.42	181.83	806.31	1215.16	723.43	400.91	571.25	676.30
Wholesale mechanical repairs	36.29	81.26	1.07	0.00	75.27	17.58	1.59	0.22	24.62	0.00
Other wholesale repairs	469.04	840.39	651.14	3.06	328.00	377.22	363.74	297.32	6.88	11.29
Retail trade	208.32	473.28	70.11	22.41	716.91	150.56	153.93	123.81	121.55	80.38
Retail mechanical repairs	712.44	874.32	107.38	0.00	438.44	172.40	288.21	260.05	165.44	68.79
Other retail repairs	23.48	17.85	47.78	1101.68	20.18	23.01	27.66	20.14	42.28	0.00
Accommodation, cafes and restaurants	257.45	415.68	336.40	0.00	20.04	395.60	1429.73	473.40	405.40	58.21
Road transport	467.62	543.43	98.73	53.05	164.38	250.92	294.53	100.70	389.88	144.04
Rail, pipeline and other transport	84.25	124.58	15.40	1.49	129.10	63.48	89.35	39.12	6.89	6.36
Water transport	3.64	102.98	0.15	0.16	31.88	70.46	31.49	32.87	71.57	10.57
Air and space transport	108.71	457.02	146.42	0.07	46.97	265.89	556.02	210.09	299.38	113.48
Services to transport, storage	4279.14	640.42	186.86	6.39	1440.85	546.41	1185.68	865.54	1120.62	481.32
Communication services	1584.87	1385.34	2238.48	16.59	1490.04	1651.04	2679.59	475.14	1822.75	99.93
Finance	971.83	1036.47	38388.03	6387.55	4822.26	889.67	2732.08	895.87	2538.96	287.73
Ownership of dwellings	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other property services	2848.14	3954.93	2035.85	2135.99	25342.34	333.86	4208.77	2557.51	557.73	106.63
Scientific research, technical and computer services	2460.93	691.59	1258.64	28.22	2552.66	7138.12	5398.46	1272.41	2383.55	60.81

Table B.1(j) Australia input-output flow table with direct allocation of imports – $2009m (continued)

	Services to transport, storage	Commun-ication services	Finance	Ownership of dwellings	Other property services	Scientific research, technical and computer services	Legal, accounting, marketing and business management services	Other business services	Govern-ment admin-istration	Defence
Legal, accounting, marketing and business management services	1576.41	670.55	3920.44	476.39	5066.07	4302.33	4389.78	1210.08	1815.81	289.37
Other business services	1801.82	585.32	1768.95	3.39	4121.64	2299.34	3114.86	1198.50	843.49	42.06
Government administration	455.92	306.06	82.43	5.28	99.97	425.71	471.22	105.03	1494.19	46.80
Defence	19.57	5.68	6.11	0.02	3.73	9.76	8.29	4.33	14.87	0.28
Education	214.53	48.87	584.44	0.01	209.72	457.66	547.59	295.57	195.85	42.01
Health services	85.43	78.21	20.12	0.01	10.95	13.46	11.36	10.09	43.24	58.02
Community services	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Motion picture, radio and television services	26.85	104.12	344.31	0.00	1294.89	1242.15	1737.30	565.23	113.23	85.69
Libraries, museums and the arts	25.28	43.17	136.21	0.00	119.85	161.10	353.28	88.32	45.67	12.54
Sport, gambling and recreational services	10.25	26.38	102.32	0.00	130.06	178.50	35.02	88.55	65.07	107.23
Personal services	1.05	29.19	3.16	0.06	34.73	53.01	77.10	28.21	2.96	43.93
Other services	30.81	19.58	9.14	0.00	71.63	46.61	58.14	31.34	35.04	26.62
Total intermediate usage including imports	**25567**	**27613**	**54460**	**14516**	**55612**	**31211**	**37774**	**15326**	**21317**	**11306**
Wages and salaries	9376	9636	44477	0	13749	25997	25657	23608	33990	4940
Gross surplus	15355	16546	37406	98384	27291	3241	7478	8761	1185	4547
Indirect taxes on production	1996	1466	4961	10668	2553	1410	3021	934	1170	726
Total gross output	**52294**	**55260**	**141304**	**123568**	**99205**	**61859**	**73930**	**48629**	**57663**	**21519**
Value added at factor cost to output ratio	0.51	0.50	0.61	0.88	0.44	0.50	0.49	0.68	0.63	0.47
Share of wages and mixed income in value added	0.37	0.41	0.55	0.00	0.38	1.01	0.90	0.86	0.95	0.49
Employment to gross output ratio	5.17	6.20	4.09	0.00	3.40	10.93	9.07	7.60	11.86	7.68
Foreign ownership ratio	0.10	0.10	0.20	0.00	0.10	0.15	0.05	0.15	0.00	0.00
Direct tax rate on surplus	0.02	0.12	0.39	0.00	0.09	0.22	0.23	0.09	0.00	0.00
Indirect tax rate on production	0.07	0.04	0.05	0.11	0.04	0.03	0.08	0.02	0.03	0.06
Foreign income payout ratio	0.06	0.04	0.06	0.00	0.05	0.00	0.00	0.02	0.00	0.00
Replacement depreciation to value added ratio	0.23	0.20	0.08	0.00	0.15	0.11	0.07	0.04	0.13	0.13
Net national product ratio	0.72	0.76	0.86	1.00	0.80	0.89	0.93	0.94	0.87	0.87
Domestic income distribution ratio	0.51	0.38	0.24	0.00	0.48	0.00	0.08	0.11	0.00	0.00

Table B.1(k) Australia input-output flow table with direct allocation of imports – $2009m (continued)

	Education	Health services	Community services	Motion picture, radio & television services	Libraries, museums & the arts	Sport, gambling & recreational services	Personal services	Other services	Households	Current government expenditure
Sheep	0.00	0.00	9.92	0.00	0.00	0.00	0.00	108.00	7.44	0.00
Grains	0.00	0.09	0.02	0.04	0.02	0.02	0.02	0.04	0.00	0.00
Beef cattle	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.60	0.00
Dairy cattle	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.44	0.00
Poultry	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	424.46	0.00
Other agriculture	7.71	8.28	6.60	238.60	39.74	500.36	59.22	31.39	5505.94	0.00
Services to agriculture, hunting and trapping	0.00	0.00	5.14	3.01	0.75	2.79	3.37	25.29	45.25	192.25
Forestry and logging	0.00	0.00	0.00	0.63	0.17	0.60	0.10	2.38	27.07	227.93
Commercial fishing	0.00	0.04	0.47	4.39	1.92	5.21	0.06	8.24	1098.56	178.32
Coal	1.30	2.09	0.11	1.92	0.65	2.34	0.45	1.04	16.49	1.69
Gas	54.14	87.14	15.29	9.04	4.34	12.14	7.53	31.40	532.34	4.66
LNG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Oil	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Iron ores	0.18	0.45	0.04	0.54	0.19	0.73	0.19	0.41	0.88	0.03
Non-ferrous metal ores	0.72	1.94	0.17	1.53	0.55	2.04	0.53	1.52	2.20	0.10
Other mining	0.08	0.27	0.42	21.25	4.74	24.09	0.87	5.20	2.48	0.02
Services to mining	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	83.87
Meat and meat products	29.90	7.05	4.59	17.28	7.31	86.51	4.62	67.44	6065.47	3.11
Dairy products	116.71	17.76	17.49	6.16	3.89	26.68	2.50	156.79	5107.57	0.01
Fruit and vegetable products	7.80	7.42	1.40	2.05	2.10	5.14	1.04	5.60	2224.83	0.00
Oils and fats	6.96	5.32	1.03	1.97	1.38	4.79	4.42	2.81	719.19	11.60
Flour mill products and cereal foods	11.65	13.66	4.09	26.39	10.80	31.98	5.79	17.95	2013.20	0.01
Bakery products	56.26	20.88	12.34	4.69	2.80	8.82	0.53	8.44	2704.53	0.01
Confectionery	7.96	3.99	1.38	23.82	10.90	126.65	5.50	11.25	1949.20	0.01
Other food products	21.93	41.55	5.37	119.65	56.32	650.60	41.63	33.69	3459.07	29.57
Soft drinks, cordials and syrups	1.52	2.79	2.10	8.34	5.79	12.76	1.09	4.91	3166.43	0.01
Beer and malt	1.94	0.87	0.13	0.45	0.33	0.80	0.15	3.03	1589.55	0.01
Wine, spirits and tobacco products	13.01	1.93	0.16	1.25	0.63	1.04	0.96	5.14	2382.18	0.01
Textile fibres, yarns and woven fabrics	6.63	3.22	0.35	1.39	0.87	1.87	1.07	4.67	128.30	0.01
Textile products	10.70	11.37	0.79	1.95	0.56	7.62	1.99	7.37	741.08	0.00
Knitting mill products	3.00	110.23	5.01	2.46	0.79	2.61	0.40	4.33	445.83	0.01
Clothing	11.88	30.90	4.67	6.43	2.85	19.04	2.82	38.44	981.29	0.01

Table B.1(k) Australia input-output flow table with direct allocation of imports – $2009m (continued)

	Education	Health services	Community services	Motion picture, radio & television services	Libraries, museums & the arts	Sport, gambling & recreational services	Personal services	Other services	Households	Current government expenditure
Footwear	1.83	6.48	0.41	1.88	0.79	7.34	0.39	1.83	230.50	0.00
Leather and leather products	1.98	1.77	0.13	3.35	1.42	72.25	0.17	0.71	29.01	0.00
Sawmill products	6.71	3.44	0.24	2.45	1.67	2.67	0.62	1.44	24.72	0.06
Other wood products	162.31	9.69	1.36	48.65	27.34	18.57	3.35	7.65	156.49	0.07
Pulp, paper and paperboard	4.02	9.56	1.04	3.67	17.92	2.57	7.44	28.04	55.88	0.00
Paper containers and products	47.16	258.65	37.46	4.26	3.88	3.53	15.16	20.99	774.17	0.00
Printing and services to printing	507.29	108.59	19.69	145.34	141.13	175.77	132.09	215.34	971.34	3.63
Publishing, recorded media, etc.	1056.02	45.82	7.98	72.59	123.35	59.50	61.94	112.42	4678.66	0.08
Petroleum and coal products	7.94	169.09	11.46	23.17	9.48	39.56	26.97	179.19	6503.08	7.76
Basic chemicals	42.07	428.06	6.93	45.71	8.71	81.11	68.55	62.63	356.94	8.39
Paints	0.87	1.43	0.32	9.53	1.88	9.13	1.25	2.41	34.49	0.01
Medicinal and pharmaceutical products, pesticides	7.74	233.39	16.51	44.78	3.71	106.84	17.68	21.40	1209.88	936.84
Soap and detergents	5.67	16.71	2.20	1.76	1.10	2.01	13.90	14.63	848.87	1.66
Cosmetics and toiletry preparations	0.33	1.18	0.07	0.38	0.07	0.65	2.60	0.37	311.89	2.06
Other chemical products	4.84	8.50	2.16	3.94	1.28	4.94	5.91	27.00	231.08	2.33
Rubber products	2.63	5.27	0.40	1.27	0.36	1.93	1.48	4.65	270.56	0.45
Plastic products	40.92	64.36	3.99	13.83	8.16	14.20	32.09	37.93	785.63	0.37
Glass and glass products	14.80	24.80	1.44	5.14	3.38	5.56	1.83	8.01	386.06	0.01
Ceramic products	4.27	0.98	0.44	1.24	0.39	1.31	0.90	0.85	64.92	0.00
Cement, lime and concrete slurry	3.29	2.92	1.78	1.57	0.63	1.38	6.22	11.25	19.11	0.02
Plaster and other concrete products	6.25	2.39	0.40	2.55	1.16	1.64	3.60	6.61	12.73	0.01
Other non-metallic mineral products	2.41	2.38	0.77	1.78	0.62	1.12	10.99	7.32	17.71	0.00
Iron and steel	34.05	9.28	1.09	8.62	5.19	7.94	5.32	12.43	52.88	1.62
Basic non-ferrous metal and products	33.69	23.78	2.97	22.28	6.91	27.74	29.48	16.44	169.38	4.74
Structural metal products	172.82	6.94	0.65	26.97	24.42	25.70	4.24	6.82	71.77	0.11
Sheet metal products	17.94	20.81	1.08	5.53	2.43	6.22	2.71	3.14	95.25	0.05
Fabricated metal products	55.74	40.89	5.33	72.91	23.16	67.12	12.35	42.52	323.56	0.09
Motor vehicles and parts, other transport equipment	64.74	15.20	2.28	20.91	8.23	18.60	5.69	28.32	7152.68	1.60
Ships and boats	1.64	1.26	0.19	3.32	0.94	2.96	0.32	4.58	563.46	1.61
Railway equipment	0.95	1.67	0.08	0.48	0.21	0.67	0.18	0.63	7.63	2.54
Aircraft	2.58	0.60	0.49	6.81	0.71	4.98	0.09	8.53	25.43	1.01
Photographic and scientific equipment	134.70	639.53	1.78	7.50	2.78	18.16	3.30	24.90	1177.30	4.37
Electronic equipment	51.50	22.98	2.08	31.43	8.05	34.32	2.76	14.57	661.28	0.06

Table B.1(k) Australia input-output flow table with direct allocation of imports – $2009m (continued)

	Education	Health services	Community services	Motion picture, radio & television services	Libraries, museums & the arts	Sport, gambling & recreational services	Personal services	Other services	Households	Current government expenditure
Household appliances	9.11	23.71	2.98	31.27	10.20	45.54	1.64	6.54	2477.13	0.04
Other electrical equipment	34.40	24.94	2.69	53.58	15.84	54.09	4.51	27.46	414.90	0.09
Agricultural, mining, etc. machinery	20.20	12.43	1.58	8.41	2.80	9.27	1.72	16.01	250.42	0.07
Other machinery and equipment	33.45	27.54	2.30	15.89	5.82	21.57	6.39	31.96	303.22	0.09
Prefabricated buildings	4.34	0.85	0.07	0.71	0.76	0.78	0.27	0.95	10.27	0.01
Furniture	209.06	7.48	1.02	16.77	21.20	10.98	3.75	9.06	2358.71	0.08
Other manufacturing	75.74	50.92	5.79	37.10	14.08	31.68	10.09	36.58	820.05	0.07
Electricity supply	1299.86	389.10	62.00	181.78	57.23	216.41	104.90	281.62	10480.47	138.55
Gas supply	50.39	64.21	13.29	6.31	2.58	7.30	6.42	13.88	1180.41	38.18
Water supply, sewerage and drainage services	98.26	131.87	21.33	39.17	16.61	41.01	63.45	170.96	5128.88	1600.23
Residential building	12.41	45.81	3.93	27.59	10.09	31.52	16.18	35.71	118.03	15.17
Other construction	20.08	66.88	6.43	37.87	13.90	43.13	21.89	51.81	242.35	4735.46
Construction trade services	59.47	77.87	12.34	18.85	11.43	20.23	14.51	37.41	333.70	17.45
Wholesale trade	1196.80	1751.80	80.23	564.08	199.19	752.74	263.89	558.54	21074.07	285.60
Wholesale mechanical repairs	3.19	0.00	0.00	1.39	0.15	2.21	0.19	2.39	0.00	0.00
Other wholesale repairs	157.38	48.90	22.32	43.25	22.79	47.28	50.38	109.74	307.28	0.00
Retail trade	444.39	260.92	28.03	197.92	81.79	239.43	50.51	158.13	73095.76	3500.41
Retail mechanical repairs	60.68	243.63	14.20	90.81	42.36	147.86	25.82	137.28	6288.31	0.00
Other retail repairs	36.77	20.55	6.62	11.34	4.04	3.20	11.00	17.48	631.97	0.00
Accommodation, cafes and restaurants	173.11	18.00	19.00	171.36	58.26	172.01	45.03	125.15	36929.27	4.17
Road transport	321.95	462.56	18.62	177.54	61.09	428.09	87.28	149.39	9914.19	1350.71
Rail, pipeline and other transport	17.03	18.90	3.59	7.59	3.78	9.21	2.53	10.22	2955.80	7.74
Water transport	11.75	1.13	6.78	32.48	5.16	180.40	6.97	64.02	441.79	0.00
Air and space transport	145.94	49.68	6.33	84.65	27.62	114.93	23.64	47.94	8426.13	0.00
Services to transport, storage	259.32	180.97	12.54	100.92	42.55	111.51	16.38	97.86	1673.46	9283.50
Communication services	1219.91	1063.92	109.79	629.65	222.77	942.51	452.73	1054.68	15865.42	101.13
Finance	1061.16	1532.18	108.37	599.73	271.89	660.91	257.07	367.98	45326.34	9.78
Ownership of dwellings	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	123166.19	-128.08
Other property services	318.30	485.89	51.82	919.47	346.22	1373.38	205.58	408.56	1258.70	71.81
Scientific research, technical and computer services	304.76	209.12	36.87	87.95	151.01	77.98	74.36	611.89	107.10	1763.98
Legal, accounting, marketing and business management services	605.67	1676.57	76.80	768.78	262.84	1049.42	436.74	508.53	3125.06	353.37
Other business services	489.54	1258.27	122.38	529.72	296.62	881.17	462.28	846.64	1286.38	4443.75

Table B.1(k) Australia input-output flow table with direct allocation of imports – $2009m (continued)

	Education	Health services	Community services	Motion picture, radio & television services	Libraries, museums & the arts	Sport, gambling & recreational services	Personal services	Other services	Households	Current government expenditure
Government administration	284.70	114.37	13.89	18.88	20.03	16.52	65.08	17.71	1418.87	48922.65
Defence	1.90	0.51	0.20	0.54	0.97	0.49	0.64	4.94	0.00	21228.67
Education	756.21	76.87	15.69	34.67	94.49	21.92	49.31	282.61	20514.94	33273.19
Health services	49.77	480.58	4.55	25.36	2.13	39.81	3.50	34.02	23522.61	48432.90
Community services	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3004.38	13455.31
Motion picture, radio and television services	11.51	14.04	9.46	2681.19	210.13	401.62	69.93	82.99	1907.64	1520.61
Libraries, museums and the arts	606.48	24.18	14.11	215.34	165.80	165.23	0.95	82.08	979.51	3513.40
Sport, gambling and recreational services	189.45	149.63	43.52	523.26	42.74	545.92	15.65	66.45	14871.53	2093.68
Personal services	51.89	559.33	2.41	39.79	6.22	12.62	14.40	9.34	9092.39	175.64
Other services	30.67	62.82	5.10	4.14	1.84	8.49	12.86	16.86	9898.33	14550.98
Total intermediate usage including imports	**15872**	**17842**	**1362**	**11299**	**4110**	**12951**	**4039**	**9231**		
Wages and salaries	43195	47633	11048	2589	2429	4977	4570	13807		
Gross surplus	3582	6524	3721	2428	949	2780	1755	2053		
Indirect taxes on production	1321	1862	333	482	163	567	267	808		
Total gross output	**63970**	**73862**	**16464**	**16798**	**7652**	**21275**	**10630**	**25899**	**590654**	**220243**
Value added at factor cost to output ratio	0.75	0.76	0.92	0.33	0.46	0.39	0.62	0.64		
Share of wages and mixed income in value added	0.94	0.92	0.80	0.54	1.10	0.73	1.23	0.85		
Employment to gross output ratio	12.97	12.19	14.95	7.72	21.08	14.42	25.65	11.97		
Foreign ownership ratio	0.01	0.02	0.01	0.08	0.01	0.05	0.00	0.03		
Direct tax rate on surplus	0.03	0.06	0.01	0.08	0.04	0.18	0.04	0.03		
Indirect tax rate on production	0.02	0.03	0.02	0.07	0.03	0.05	0.03	0.04		
Foreign income payout ratio	0.00	0.00	0.00	0.03	0.00	0.01	0.00	0.00		
Replacement depreciation to value added ratio	0.09	0.06	0.06	0.37	0.06	0.22	0.12	0.08		
Net national product ratio	0.91	0.93	0.93	0.60	0.94	0.77	0.88	0.91		
Domestic income distribution ratio	0.06	0.07	0.19	0.37	0.00	0.22	0.00	0.13		

Table B.1(l) Australia input-output flow table with direct allocation of imports – $2009m (continued)

	Construction investment	Equipment investment	Inventories	Exports
Sheep	0.00	367.11	-8.63	1648
Grains	0.00	0.00	-64.03	5317
Beef cattle	0.00	2254.63	-37.56	490
Dairy cattle	0.00	459.16	0.55	52
Pigs	0.00	0.00	-14.40	0
Poultry	0.00	0.00	-19.61	8
Other agriculture	0.00	0.00	-25.27	1108
Services to agriculture, hunting and trapping	0.00	0.00	-48.42	415
Forestry and logging	0.00	0.00	-16.53	111
Commercial fishing	0.00	0.00	0.20	229
Coal	0.00	568.02	142.88	52158
Gas	0.00	3201.73	341.65	0
LNG	0.00	0.00	0.00	10086
Oil	0.00	0.00	0.00	8757
Iron ores	0.00	3.58	1.01	32652
Non-ferrous metal ores	0.00	131.56	-0.94	9501
Other mining	0.00	4.53	2.49	815
Services to mining	0.00	1354.05	0.00	6
Meat and meat products	0.00	46.94	58.23	5538
Dairy products	0.00	24.20	-5.49	2415
Fruit and vegetable products	0.00	37.87	28.69	995
Oils and fats	0.00	12.50	9.13	409
Flour mill products and cereal foods	0.00	42.06	5.52	1049
Bakery products	0.00	34.54	-2.99	383
Confectionery	0.00	29.83	16.29	555
Other food products	0.00	115.58	-18.45	3924
Soft drinks, cordials and syrups	0.00	9.59	-6.64	208
Beer and malt	0.00	10.96	-1.19	386
Wine, spirits and tobacco products	0.00	20.49	-0.94	2593
Textile fibres, yarns and woven fabrics	0.00	49.14	-5.38	342
Textile products	0.00	449.10	10.85	188
Knitting mill products	0.00	14.80	7.10	60
Clothing	0.00	87.42	-2.87	612
Footwear	0.00	18.90	-2.29	79
Leather and leather products	0.00	25.96	7.04	853

Table B.1(l) Australia input-output flow table with direct allocation of imports – $2009m (continued)

	Construction investment	Equipment investment	Inventories	Exports
Sawmill products	0.00	33.84	13.24	988
Other wood products	0.00	136.99	14.28	165
Pulp, paper and paperboard	0.00	10.03	23.00	575
Paper containers and products	0.00	18.60	1.81	317
Printing and services to printing	0.00	35.38	-7.12	195
Publishing, recorded media, etc.	0.00	664.14	19.64	337
Petroleum and coal products	0.00	4835.19	91.99	2642
Basic chemicals	0.00	171.26	16.52	2173
Paints	0.00	31.11	2.45	145
Medicinal and pharmaceutical products, pesticides	0.00	55.56	-1.65	2483
Soap and detergents	0.00	13.30	-0.16	264
Cosmetics and toiletry preparations	0.00	4.51	-0.27	277
Other chemical products	0.00	26.95	-4.89	477
Rubber products	0.00	44.93	1.00	256
Plastic products	0.00	495.63	2.16	716
Glass and glass products	0.00	25.24	4.32	285
Ceramic products	0.00	5.96	4.04	95
Cement, lime and concrete slurry	0.00	24.71	17.36	50
Plaster and other concrete products	0.00	31.73	45.95	59
Other non-metallic mineral products	0.00	8.86	16.48	118
Iron and steel	0.00	368.19	-26.72	4081
Basic non-ferrous metal and products	0.00	248.57	-90.04	34003
Structural metal products	0.00	323.32	60.62	278
Sheet metal products	0.00	966.17	11.80	235
Fabricated metal products	0.00	1213.54	14.21	816
Motor vehicles and parts, other transport equipment	0.00	4265.86	-18.35	3037
Ships and boats	0.00	675.16	-3.93	302
Railway equipment	0.00	431.41	-0.53	67
Aircraft	0.00	764.41	-4.96	529
Photographic and scientific equipment	0.00	775.40	1.48	1587
Electronic equipment	0.00	1053.21	-6.66	1075
Household appliances	0.00	776.38	29.04	260
Other electrical equipment	0.00	641.62	-16.43	777
Agricultural, mining, etc. machinery	0.00	3181.43	23.91	1013
Other machinery and equipment	0.00	2497.14	15.09	1612

Table B.1(l) Australia input-output flow table with direct allocation of imports – $2009m (continued)

	Construction investment	Equipment investment	Inventories	Exports
Prefabricated buildings	0.00	248.88	0.96	38
Furniture	0.00	1527.52	2.36	156
Other manufacturing	0.00	462.21	32.19	1137
Electricity supply	0.00	5618.74	3.14	65
Gas supply	0.00	872.11	176.07	2
Water supply, sewerage and drainage services	0.00	748.00	0.00	12
Residential building	51612.53	0.00	0.00	131
Other construction	99054.39	0.00	0.00	188
Construction trade services	25627.21	0.00	-0.69	398
Wholesale trade	0.00	20936.44	-31.07	14076
Wholesale mechanical repairs	0.00	0.00	0.00	0
Other wholesale repairs	0.00	0.00	0.00	1
Retail trade	0.00	2495.55	4.31	4076
Retail mechanical repairs	0.00	0.00	0.00	21
Other retail repairs	0.00	0.00	0.00	0
Accommodation, cafes and restaurants	0.00	1.36	0.00	5417
Road transport	0.00	2825.68	-17.96	7703
Rail, pipeline and other transport	0.00	109.78	-0.70	4429
Water transport	0.00	8.45	0.09	976
Air and space transport	0.00	58.65	0.00	4633
Services to transport, storage	0.00	85.99	-0.21	3365
Communication services	0.00	3980.24	0.00	816
Finance	0.00	142.67	0.00	1453
Ownership of dwellings	0.00	0.00	0.00	529
Other property services	0.00	8617.07	0.00	569
Scientific research, technical and computer services	0.00	12231.62	0.00	2652
Legal, accounting, marketing and business management services	0.00	955.75	0.00	2312
Other business services	0.00	0.00	0.00	970
Government administration	0.00	347.48	0.00	41
Defence	0.00	84.50	0.00	84
Education	0.00	64.59	0.00	4788
Health services	0.00	26.80	0.00	612
Community services	0.00	0.00	0.00	4
Motion picture, radio and television services	0.00	565.14	0.00	232

Table B.1(l) Australia input-output flow table with direct allocation of imports – $2009m (continued)

	Construction investment	Equipment investment	Inventories	Exports
Libraries, museums and the arts	0.00	85.63	0.00	162
Sport, gambling and recreational services	0.00	0.00	0.00	596
Personal services	0.00	0.00	0.00	163
Other services	0.00	0.00	0.00	48
Total intermediate usage including imports				
Wages and salaries				
Gross surplus				
Indirect taxes on production				
Total gross output	**176296**	**139197**	**587**	**269081**
Value added at factor cost to output ratio				
Share of wages and mixed income in value added				
Employment to gross output ratio				
Foreign ownership ratio				
Direct tax rate on surplus				
Indirect tax rate on production				
Foreign income payout ratio				
Replacement depreciation to value added ratio				
Net national product ratio				
Domestic income distribution ratio				