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Report to the Australasian
Soft Drink Association

An Australasian Standard for Formulated Water-Based Non-Alcoholic (Functional) Beverages

The Economic Benefits

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Abbreviations

\$AUS	Australian Dollar
\$US	United States Dollar
ABARE	Australian Bureau of Agricultural and Resource Economics
ABS	Australian Bureau of Statistics
ANZFA	Australia and New Zealand Food Authority
CGE	computable general equilibrium
CoPS	Centre for Policy Studies
FSANZ	Food Standards Australia New Zealand
FDA	Food and Drug Administration
GDP	Gross Domestic Products
NAIRU	non-accelerating inflation rate of unemployment
NPV	Net Present Value
NZ	New Zealand
R&D	research and development
US	United States
WHO	World Health Organization

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Executive Summary

Functional beverages are a fast-growing component of the overall non-alcoholic beverage market. There are five main categories of functional beverages:

- sports drinks including isotonic drinks and others that contain mineral salts and other electrolytes and are designed to assist with optimal hydration and enhance sporting performance;
- lifestyle/wellness drinks which typically incorporate vitamins and minerals, and/or herbal supplements that are linked with achieving a balanced lifestyle;
- energy drinks which typically contain caffeine and/or other herbal ingredients are designed to assist with concentration and focus;
- meal-replacement drinks which contain nutrients and can be used as part of a calorie-controlled diet; and
- medicinal teas.

There are a number of factors underlying the strong growth in the functional beverages market, including growing health awareness and a desire to undertake more 'preventative' action, increased levels of self-medication, rising real incomes, and the ability for functional beverages to address consumer demand for a balanced diet in a time-efficient manner within the context of a busy work and social lifestyle.

The functional beverage market in Australia is relatively immature compared to New Zealand and overseas markets such as the United States (US), due to the regulatory impediments to production. Regulations permit only the production of isotonic/sports drinks and more recently, 'energy drinks'. Previously, 'energy drinks' were imported from New Zealand. The regulatory framework has as a result limited the products available on the Australian market. Elsewhere it has been the non-sports drinks segments that have produced the most significant growth.

Introduction of a standard for 'Formulated Non-alcoholic Water-based Beverages' will allow: the production of a range of entirely new functional beverages; development of even greater numbers and variety of product into the future.

We estimate that such a regulatory change will have a number of benefits including:

- a significant increase in the market for functional beverages in Australia, estimated to be around a \$600 million increase in yearly sales. However, this is unlikely to have significant net benefits for the domestic economy as it reflects a change in the composition of the economy rather than an increase in the economy's size. There will be benefits for consumers in terms of better matching of preferences, though these are difficult to quantify;
- some short term export increases of functional beverages, in the order of \$9 million to \$30 million per year, depending on the assumptions made. There is the possibility that these will increase into the future if the functional beverage market continues to grow as expected, and if Australian producers are able to lift their export performance above historical levels;
- a range of long term impacts (ie, allowing for the economy to adjust to the changes brought on by the short term impacts), including:
 - benefits to the Australian economy as a whole arising from the increase in the market for functional beverages. These include:
 - an increase in Gross Domestic Products (GDP) in the order of \$1.2 to \$4.2 million per year; and
 - an increase in domestic non-tradables (private and public consumption and investment) in the order of \$4.3 million to \$14.6 million per year. This value reflects the higher domestic standard of living achieved from the introduction of the Standard. The Net Present Value (NPV) of the improvement to the domestic non-tradables sector lies somewhere between \$69 million and \$234 million.

We suggest that the upper bounds of these estimates are the most appropriate measure of the benefits provided by the Standard because they reflect the conservative nature of the estimates and the potential for higher than forecast growth rates;

- an improved scale of operations for domestic beverage manufacturers;
- reduced instability in the sector by moving toward value-add products;
- continuation of the benefits currently enjoyed by NZ consumers and the non-alcoholic beverage industry, as well as potential for expansion and continued export growth over time;
- a range of direct benefits that are difficult to quantify, including:
 - improved consumer choice;
 - improved lifestyle benefits, and flow-on benefits to the extent that consumption of functional beverages improves the achievement of a balanced diet; and
 - improved R&D capabilities.

In summary, the main beneficiaries of the introduction of a Formulated Water-Based Non-Alcoholic Beverage Standard will be consumers, the beverage sector, manufacturers supplying materials to the beverage sector, and the community more broadly because of increased growth in the economy.

Section One

Context and Overview

Non-alcoholic beverages play a significant role in our day-to-day life, fulfilling a number of functions including health related, leisure, and social activities. Within the non-alcoholic segment, there are a number of product categories, including juices, still, carbonates, and functional beverages.

The beverage market as a whole continues to grow at rates greater than population increases, and within this context the functional beverage category is showing significant growth in a number of world markets. Functional beverages are those that have some benefit over and above the standard beverage properties of taste and hydration. Typically these benefits include sports drinks, energy drinks, drinks with additional vitamins and minerals, or drinks with added herbal ingredients that are thought to have health benefits. Underlying demand factors include growing awareness of healthy diets, growing incomes, and a desire to meet health needs in a time-efficient manner.

Functional beverages are well-placed to meet these demands as they can be consumed in a variety of settings, have no preparation time, and can combine other important consumer attributes such as taste and image.

Current regulatory restrictions prohibit the manufacture of most functional beverages in Australia with the exception of sports drinks and (more recently) 'energy drinks' which can now be produced under the *Formulated Caffeinated Beverages Standard*. Functional beverages are permitted to be manufactured in most other countries including through Asia, Europe, and North America. Some functional beverages such as sports drinks can be produced under the existing regulatory framework, but the fastest growing categories with the most significant future potential (eg, lifestyle drinks, vitamin-fortified, herbal additives etc) are not currently permitted to be produced in Australia.

The Australasian Soft Drink Association has commissioned The Allen Consulting Group to analyse the economic benefits of developing an Australasian Standard for Water-Based Non-Alcoholic Water Based Beverages (ie, 'functional' beverages). Such a Standard would allow for the manufacture of such beverages within Australia, including those not currently produced, and continue the current permission in NZ.

The main components of this task have been:

- a review of available reports and information outlining the nature of the beverage market, including segments where production is and is not permitted in Australia;
- the assessment of the export potential for functional beverages into Asia;
- targeted consultation with key players in the beverage industry, to understand the practical implications of the development of a Standard, and likely industry responses;

- conceptually mapping and developing scenarios to understand the range of possible impacts associated with the introduction of a Standard, the magnitude of such impacts, as well as their distribution; and
- macro-econometric modelling of the likely changes to understand the economy-wide implications, using the MONASH model developed by the Centre for Policy Studies (CoPS) at Monash University.

This report is set out in the following manner:

- Section Two provides an overview of the market for non-alcoholic beverages;
- Section Three identifies the short-run impacts associated with the development of the standard;
- Section Four, drawing on Section Three, presents the long-run impacts of the standard's development; and
- Appendix A provides a technical description of the model used to estimate the long-run impact of the Standard.

Section Two

The Market for Non-Alcoholic Beverages

This section provides some insight into the nature of the market for non-alcoholic beverages as a whole, and a description of the functional beverage market in particular (which is a rapidly growing segment of this overall market). After providing descriptions of each of these markets, we describe the Australian regulatory context, which has had significant influence on the nature of the market.

While looking at general market trends is instructive, the main focus of this section is to identify the nature of the impact of introducing a Standard allowing the Australian production of functional beverages where production is not currently permitted in Australia. This means the focus is on a particular segment of functional beverages as some functional beverages (for example sports drinks) are already produced in Australia.

2.1 Overview — The Non-Alcoholic Beverage Market

Before considering the functional beverage segment, it is instructive to consider the overall non-alcoholic beverage market as a whole, because:

- as the functional beverage segment is an emerging category, more data is available on the beverage market as a whole; and
- many of the characteristics of the market as whole apply equally well to the individual segments.

Characterising the Market: The Nature of the Product

Within the overall definition of 'beverages', the first broad distinction that can be made is between alcoholic and non-alcoholic beverages. Our focus is on the latter, which comprises segments such as:

- carbonated and non-carbonated;
- juices;
- cordials and syrups, including powdered bases for drinks;
- water and near-water;
- natural and organic products; and
- functional beverages.

There are strong inter-linkages between these categories. Indeed, some segments are sub-components of the other categories.

Consumption tends to be price and income-sensitive. Other factors that influence demand levels include:

- nature of social engagements — an increasing number of meals eaten away from the home tends to increase consumption of commercial non-alcoholic beverages;
- climate;
- broader lifestyle and taste factors;
- distribution and packaging, including greater prevalence of availability, and packaging design innovations to make the product more user-friendly; and
- environmental, for example in relation to concerns about water quality.

The Size of the Market in Australia and New Zealand

The non-alcoholic beverage industry is relatively significant in Australia, it ranks 157 out of 500 by industry turnover. Some key statistics are included in Table 2.1.

Table 2.1

KEY STATISTICS — NON-ALCOHOLIC BEVERAGE MARKET

	1995–1996	2000–2001
Industry turnover (\$ million) 2000–01 prices	2,201.2	2,893.0
Number of Establishments	118	136
Number of Enterprises	99	94
Employment	6,078	5,903
Exports (\$ million) 2000–01 prices	64.8	43.8
Imports (\$ million) 2000–01 prices	270.1	408.3
Total wages (\$ million) 2000–01 prices	230.3	269.1

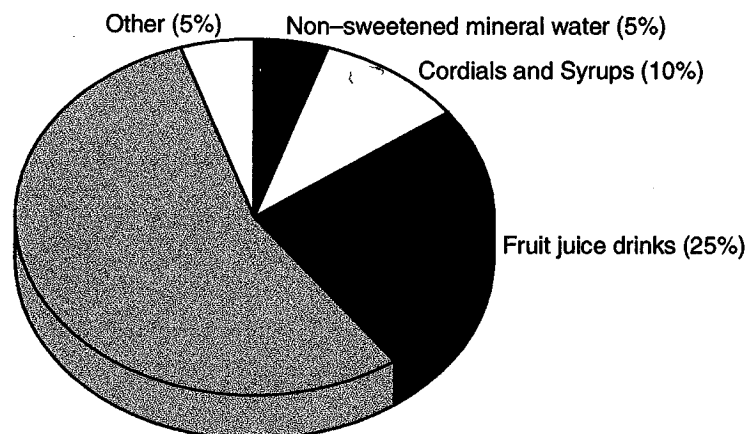
Source: IBIS World Pty Ltd (April 2002), *C2181 Soft Drink, Cordial and Syrup Manufacturing in Australia*

Total domestic demand in Australia is \$3.3 billion, which includes domestic production supplying domestic demand, plus \$408 million of imports.

The share of the Australian market between categories (in value terms) is shown in Figure 2.1.

Figure 2.1

THE AUSTRALIAN NON-ALCOHOLIC BEVERAGES MARKET MAKE-UP



Flavoured or sweetened aerated waters and mineral waters (55%)

Source: IBISWorld Pty Ltd (April 2002) C2181 – Soft Drink, Cordial and Syrup Manufacturing in Australia

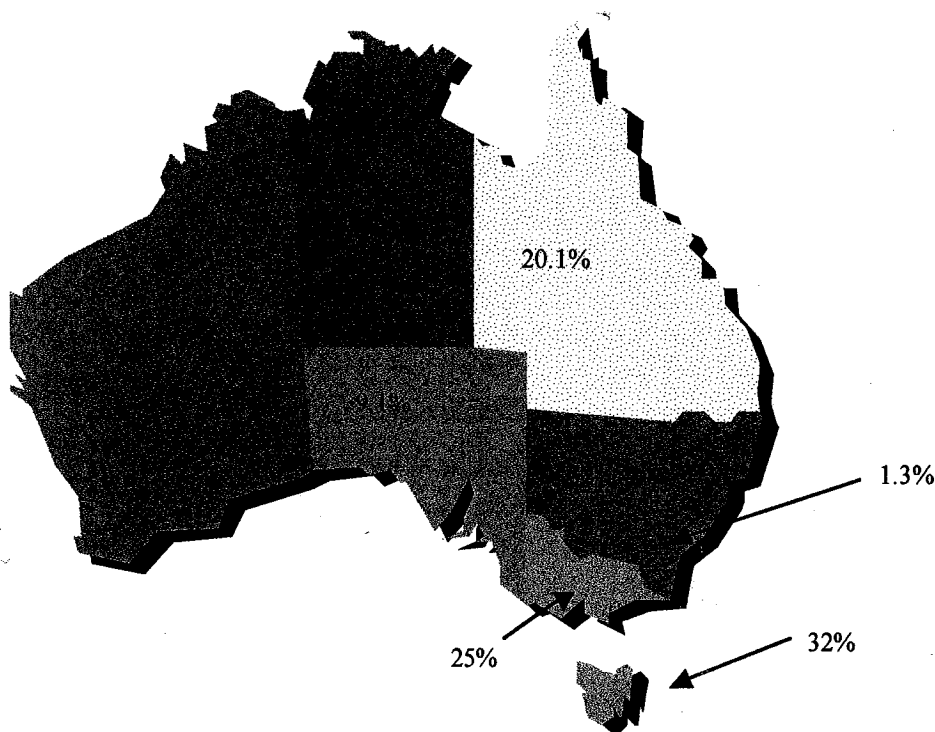
The Nature of Production and Supply

The following characteristics are evident in the non-alcoholic beverage market as a whole, as well as within the individual segments such as functional beverages.

The market for non-alcoholic beverages is characterised by fierce competition, with large global companies supplemented by niche players that are typically regionally based (see Figure 2.2). There is significant product differentiation, and efforts to build brand names and associated loyalty.

Figure 2.2

**PRODUCTION PATTERNS ACROSS AUSTRALIA — NON-ALCOHOLIC BEVERAGES
(BY SHARE OF VALUE)**



Source: ABS Catalogue 8221 *Manufacturing Industry Australia*

The industry is relatively capital-intensive, with around ten percent of total costs attributable to direct wages in the sector. Other major sources of cost include distribution/logistics, packaging, and advertising, with the last of these an indication of the competitive.

Because of the expense of long-distance transport, beverages are typically made under licence in the target market.

Industry concentration is high, with the four largest enterprise groups accounting for around 90 to 93 percent of industry turnover, depending on the precise sub-category within the overall beverage market.

There are strong linkages between the sector and other enterprises within the economy. The major other industries upstream and downstream of beverage manufacturers include:

- producers of packaging, including glass, plastics, and aluminium;
- transport, distribution and logistics providers;
- wholesalers; and
- significant impacts on a range of large and small retail businesses including supermarket chains and a huge variety of food service outlets.

Imports and Exports

Imports comprised 12.5 percent of domestic demand in 2000–01 and have been in the range of ten to twelve percent of domestic demand in the past five years.

Most of this product derives from Europe. The major sources of imports into Australia are as follows:

- European Union — \$48 million;
- Asia – \$8 million; and
- NAFTA – \$13 million.

The growth in imports also reflects the regulatory context in Australia that has led to increased imports from NZ in categories such as functional beverages.

Exports were 1.5 percent of domestic production in 2000–01, and were mainly of fruit juice, sweetened and flavoured mineral and aerated waters. Major markets include Singapore, Malaysia and Hong Kong.

The nature of non-alcoholic beverages means that the economics of imports and exports are generally poor:

- beverages are mainly water which is high volume and low value, so relatively costly to transport;
- the nature of the packaging means that breakage is an issue in transport; and
- water is available in all locations.

This means that many products are made under licence in the target market, or by local arms of global corporations.

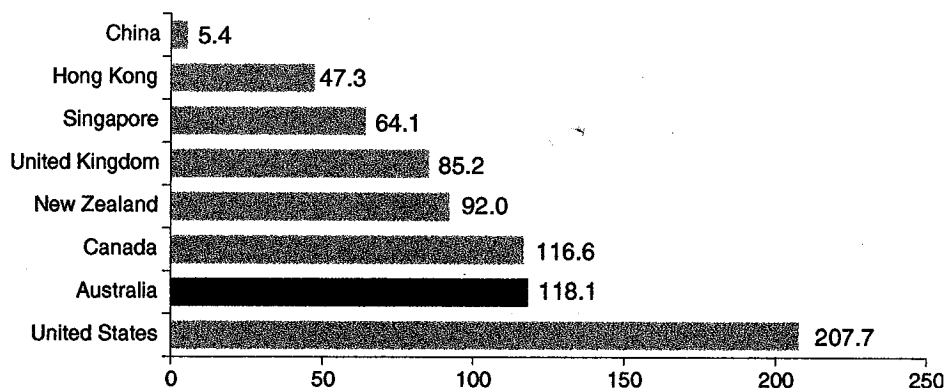
Australia is a small player in the global beverage market, but has a number of advantages, including:

- established links and branding into a number of markets;
- proximity and relative cost advantage to the Asian markets; and
- small changes in world market demands have significant implications for Australian production.

Furthermore, indications are that there is considerable scope for further exports into Asia. Australia has one of the highest per-capita consumption levels of soft drinks in the world. Based on data from the Canadian Soft Drink Association some of the annual per capita consumption levels (in litres) are as follows:

Figure 2.3

ANNUAL PER CAPITA CONSUMPTION OF SOFT DRINKS (LITRES)



Source: Canadian Soft Drink Association *Selected Soft Drink Markets from Around the World*, based on 1998 data. <http://www.softdrink.ca/tp100t1e.htm> accessed June 2002.

This shows the large potential size of the market in Asian countries if they continue toward Western consumption levels in the future.

Despite the lower per-capita consumption rates, the total Asian market is still large, reflecting the large population levels. For example, total consumption of soft-drink in China is more than three times total consumption in Australia, and total Japanese consumption of soft-drink is roughly equivalent to total Australian consumption.

2.2 The Market for Functional Beverages

Functional beverages are a significant, and fast-growing component of the overall non-alcoholic beverages market. In Australia, the sports drinks, energy drinks and stillled water categories are the fastest growing segments, in the order of ten percent growth per year.

Categories and Products

Broader Functional Product Market

Functional beverages can be seen as a subset of the overarching 'wellness' or 'wellbeing' market. A recent Reuters Business Insight report categorises this as a conglomeration of nutrition, health and beauty products¹. The market comprises a number of products, including:

- dietary supplements;
- functional foods;
- functional beverages;
- a range of cosmetics and general beauty products; and

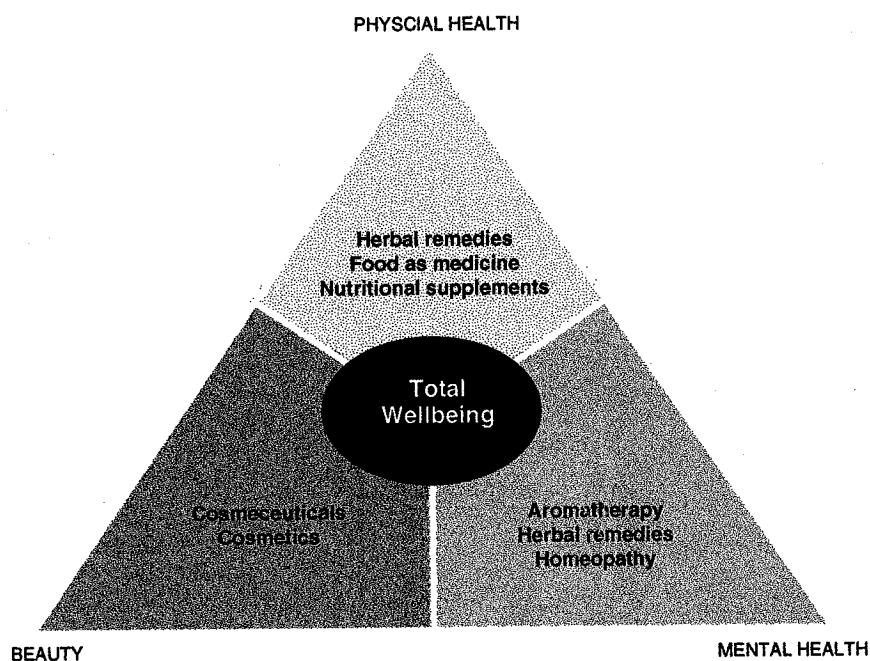
¹ Reuters Business Insight: Consumer Goods (2002), *Wellbeing: A Cross Category Approach to Nutrition, Health and Beauty*, Siddika Moosa.

- a range of products designed to stimulate mental wellbeing (eg, relaxants, aromatherapy, etc).

A diagrammatic representation of the wellness market is shown in Figure 2.4.

Figure 2.4

DEFINITION OF WELLBEING



Source: Reuters Business Insight: Consumer Goods (2002), *Wellbeing: A Cross Category Approach to Nutrition, Health and Beauty*, Siddika Moosa

There are five main categories of functional beverages:

- sports drinks including isotonic drinks and others that contain mineral salts and other electrolytes and are designed to assist with optimal hydration and enhance sporting performance;
- lifestyle/wellness drinks which typically incorporate vitamins and minerals, and/or herbal supplements that are linked with achieving a balanced lifestyle;
- energy drinks which typically contain caffeine and/or other herbal ingredients are designed to assist with concentration and focus;
- meal-replacement drinks which contain nutrients and can be used as part of a calorie-controlled diet; and
- medicinal teas.

As with 'functional foods', into the future it is expected that there will be developments in linking beverages with addressing particular health issues. This is an area of much current research and development activity.

The functional beverage market in Australia is relatively immature compared to overseas markets such as the US, due to the regulatory impediments to production. Regulations permit only the production of isotonic/sports drinks, and more recently, the production of 'energy drinks' under the *Formulated Caffeinated Beverages Standard*.

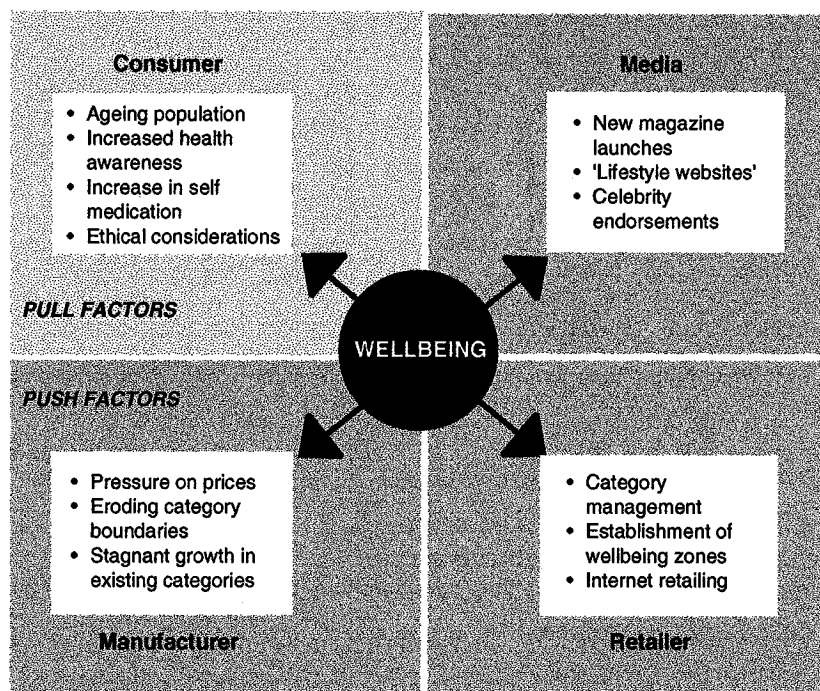
This has as a result limited the products available on the market. Elsewhere it has been the non-sports drinks segments that have produced the most significant growth.

Size

The drivers of growth in this market can be conceived as a mixture of 'push' and 'pull' factors, as represented in Figure 2.5.

Figure 2.5

WHAT IS FUELLING THE GROWTH OF WELLBEING PRODUCTS?



Source: Reuters Business Insight: Consumer Goods (2002), *Wellbeing: A Cross Category Approach to Nutrition, Health and Beauty*, Siddika Moosa

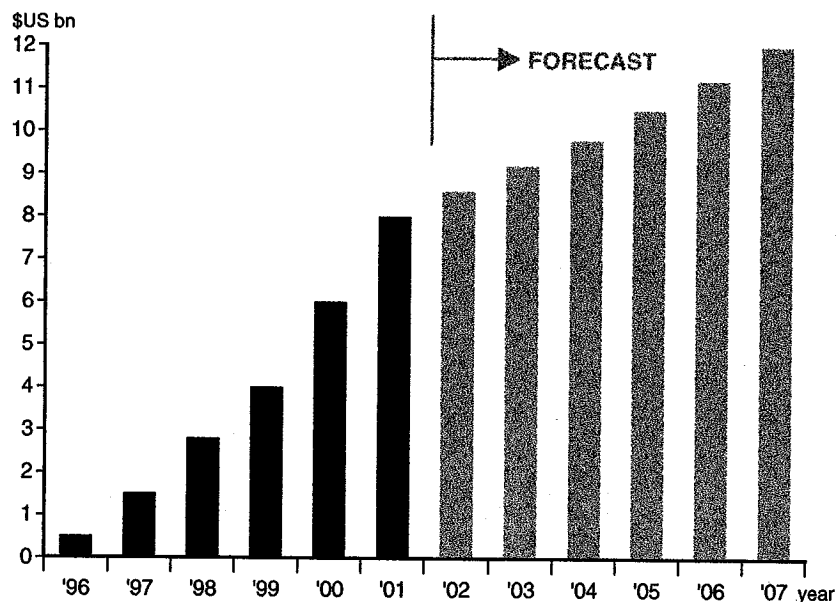
It is difficult to assess the precise scale of the functional beverage category in Australia. However, it is known that the sports drink category was \$100 million in 1995, with rapid growth in the intervening years. There has also been significant recent sales of energy drinks, and drinks with additions such as guarana.

Based on available data and views from industry experts about sales of their own brands, the size of the Australian market is estimated to be around \$200 million per year.

In comparison, the US market has grown from a niche market in 1997, to an estimated \$US8 billion per year in sales and is expected to rise to \$US12 billion per year by 2007 — see Figure 2.6. Much of the growth to date, and particularly the expected future growth, is in the energy and vitamin-enhanced beverage products.

Figure 2.6

GROWTH IN THE US FUNCTIONAL BEVERAGE MARKET ACTUAL AND FORECAST



Source: <http://www.juicedmag.com> accessed June 2002

In Australian dollars, and pro-rated on the basis of relative population, Figure 2.4 implies a market size for Australia of \$1 billion per year. This is a conservative estimate in that it does not take into account likely future predicted growth in the US which is expected to increase the size of the market by fifty percent in the next five years, nor does it take into account any further growth beyond 2007.

This conservatism is partly justified on the grounds of the relatively higher per-capita consumption levels in the US compared to Australia.

Buyers

The main source of demand for functional beverages are typically younger (twenty to forty year old) single individuals with university education, higher-than-average income levels, and some awareness of health needs.

Functional beverages provide a convenient and time-effective means of addressing health needs within the context of a busy overall lifestyle. The beverages also fit within a sense of fashion and can be consumed in a range of social engagements.

2.3 The Regulatory Context for Functional Beverages

Australia and New Zealand

The food regulator in Australia and NZ is Food Standards Australia New Zealand (FSANZ) as of 1 July 2002. Previously, the regulator was known as the Australia New Zealand Food Authority (ANZFA). FSANZ oversees the development of the Food Standards Code.² The regulations applying to food and beverages are broadly aligned in Australia and NZ, though some differences remain.

Under the provisions of the *Food Standards Code*, vitamins and minerals cannot be added to water based beverages in Australia. Further it is not permitted to make certain claims about the benefits of naturally occurring vitamins and minerals in water based non-alcoholic beverages.³

In NZ by contrast, the *Dietary Supplements Regulations* allow for the production of a large variety of foods and beverages as well as therapeutic goods containing vitamins and minerals. Because of mutual recognition arrangements between Australia and NZ, beverages produced in accordance with the *Regulations* can be sold in Australia.

Within Australia, beverage bottlers may produce under the *Supplementary Sports Foods Standard* which allows for the addition of vitamins and minerals, but requires a wide range of labelling such as "to be consumed under medical supervision" and "not recommended for children". In practice, Australian bottlers have not used this *Standard*.

Codex Requirements and the International Context

The codex alimentarius commission is part of the Food and Agriculture Organization of the United Nations, within the World Health Organization (WHO). Codex establishes international standards and guidelines for food and beverage products in the interest of harmonisation of international regulations. Standards developed by codex are also used in evaluating potential misuse of 'technical barriers to trade' between countries.

Codex considers that regulations about the addition of nutrients to food should be done on a national basis, reflecting local conditions. In the codex *General Principles for the Addition of Essential Nutrients to Foods* codex indicates that where essential nutrients are added to foods for the purpose of 'fortification', then:

"Fortification should be the responsibility of national authorities since the kinds and amounts of essential nutrients to be added and foods to be fortified will depend upon the particular nutritional problems to be corrected, the characteristics of the target populations, and the food consumption patterns of the area."

² In Australia, dietary supplements (eg, vitamins, mineral and herbal based supplements) are regulated by the Therapeutic Goods Administration.

³ It is noted that FSANZ are currently investigating the appropriate regulation of 'health claims'.

In the codex *Report of the 23rd Session of the Coded Committee on Nutrition and Foods for Special Dietary Uses* (Germany, November 2001), the Committee considered that there was not a need to develop a standard for 'sports drinks/foods' and 'energy drinks' and that no further work was required in the area.

For example, in the US, functional beverages are manufactured under the provisions of the *Dietary Supplement Health and Education Act*. The Food and Drug Administration (FDA) is the regulator and had traditionally considered dietary supplements to be essential nutrients such as vitamins, minerals and proteins. In 1990 herbs were added to the list. While functional beverages are approved for production, there are still some limitations on the nature of 'health claims' that can be made on beverage packaging – ie the linking of nutrients in the beverage and claimed health benefits.

A commonly cited reason for the strength of the functional beverages market in Japan is that the food regulation system of Foods for Specified Health Uses facilitates innovation in the market. This regulatory system permits health claims for foods and beverages covered by the umbrella of the regulations.

Conclusions

This brief overview of the regulatory arrangement suggests that the Australian regulatory framework is out-of-step with international approaches. Codex has not seen it as necessary to attempt to limit production of functional beverages. Further, the US, Japan, and many other countries around the world have devised workable systems allowing production and innovation of a range of functional beverages meeting consumer demand.

2.4 Conclusion — The Future of Functional Beverages

The clear finding that emerges from the analysis underpinning this section is that the demand factors affecting the growth of the functional beverage market are overwhelmingly positive and, but for the regulatory impediment, Australian industry has significant capability to meet this demand.

On the demand side, all factors point to growth:

- underlying demand determinants such as available time, lifestyle, growing health-awareness, etc reinforce growing demand for functional beverages;
- the potential growth in Asia is huge, and the next couple of years will be crucial for suppliers in seeking to achieve market share and entrenched branding; and
- Australian potential domestic market growth is large, mirroring the global market increases, and also reflecting Australia's relatively high per-capita consumption of non-alcoholic beverages.

Should a Standard for Formulated Water-Based Non-Alcoholic Beverages be introduced, Australian manufacturers are ideally placed to meet this demand, in both the domestic and Asian/international contexts. Australian manufacturers possess the necessary:

- operating expertise;
- size and employment base; and
- logistics/distributional links into Asia, as well as infrastructure supporting the 'Australian' brand in Asia.

Introducing a Standard would also allow New Zealand manufacturers to continue to utilise their existing expertise to meet such demand.

Section Three

The Short-Run Impacts of a Standard

There is a range of impacts associated with the introduction of a Standard permitting the production of Formulated Non-Alcoholic Water-Based Beverages in Australia. There is also a range of ways to categorise the nature of these impacts. This section outlines the initial or 'short-run' impacts (see Section Four for the qualification of the long-run impacts). The impact is further distinguished according to whether they are 'direct' or 'indirect' according to the following framework:

- direct impacts, which can be further subdivided into:
 - changes to the domestic market for beverages with impacts on producers and consumers; and
 - changes to exports of functional beverages, with implications for producers;
- indirect impacts, which arise on an economy-wide basis to the community as a whole, including:
 - employment, GDP, production in related industries etc;
 - research and development (R&D) developments and potential spin-offs; and
 - consumer lifestyle and health impacts.

Some of these impacts are more amenable to quantification than others. It is however extremely important to consider potential qualitative impacts.

Analysing the impacts and identifying possible future changes has involved the assessment of a number of information sources, including:

- specialised beverage-sector business investigative reports, such as those undertaken by Reuters, IBIS World and Canadean;
- a range of Australian Government statistics from sources such as the Australian Bureau of Statistics (ABS), the Australian Bureau of Agricultural and Resource Economics (ABARE) and the Commonwealth Department of Foreign Affairs and Trade;
- discussions with industry participants, particularly in relation to potential future responses in the future, and to 'reality test' assumptions made; and
- a range of material accessed through industry and government internet sites.

A key aspect in analysing the 'impact' of introducing a Standard is the *incremental* or *additional* effect of introducing the Standard. That is, the effects over and above what would occur in its absence. As was discussed in Section Two, some functional beverages such as sports drinks are already produced in Australia. This means that some growth in the domestic market and in exports could be expected regardless of whether or not a new Standard is introduced.

Taking the global experience as a guide, however, the predominant drivers of functional beverage market exports are the segments other than sports-drinks. Thus much of the changes in the functional beverage market can be attributed to the introduction of a Standard.

Introducing a Standard would continue the benefits currently enjoyed by NZ consumers and the non-alcoholic beverage industry, as well as providing the potential for expansion and continued export growth in the NZ industry over time.

3.1 Supply Impacts

Domestic Demand

As described in Section Two, the current Australian market for non-alcoholic beverages is \$2.6 billion. Of this, exports are 1.5 percent (ie, \$43 million). The largest market for exports is currently into Asia.

The current market for functional beverages in Australia is approximately \$200 million per annum in sales. An upper end future Australian market size can be assessed by taking a pro-rata calculation from the US market which is \$US8 billion in sales per year.⁴ This equates to around \$13 billion in Australian currency. Making a pro-rata calculation on the basis of population, this suggests around \$1 billion as the market for functional beverages in Australia, an increase over the current market of \$800 million. This is a conservative estimate as it does not include the predicted growth in the US market in the next few years to 2007 (see Figure 2.6).

Some of this expected future growth would be redistribution between different beverages (or even between non-beverages and beverages), so the net benefit will be less than simply the increase in the domestic beverage market.

This substitution can be seen by looking at those products that incorporate vitamins and minerals. If functional beverage products become available into the future because of the introduction of a Standard, they are likely to take market share away from similar products in non-beverage markets such as the dietary supplement market. While this means that the net gain to the domestic economy as a whole is modest, it reinforces the increase in the functional beverage market itself.

⁴ The US market includes production of the sports drink category which is permitted in Australia, as well as all the other functional beverage segments not currently permitted in Australia.

The conclusion from this section is that a large part of any growth in the functional beverage market would be attributable to the introduction of a Standard. Taking a conservative estimate of 75 percent of the increase in the functional beverages market being attributable to the introduction of the Standard, this yields 75 percent of \$800 million (ie, a \$600 million) increase in the domestic functional beverage market.

Export Potential

The Asian market for functional beverages is growing significantly, with rising incomes, and trends toward greater 'Westernisation' in consumption trends. In some markets such as Japan the market is more mature — Japan is widely credited as being the early innovator in functional beverages and has a regulatory system that facilitates development of such products.

Australia already has substantial market presence and branding in Asia, and exports food and beverages, so distribution networks are established. There are therefore real export opportunities. However, the economics of beverage transport are such that there is a cap on potential exports.

It is difficult to get precise forecasts of changing conditions in specific markets. Without comprehensive consumer surveys to analyse current and likely future consumption patterns, the other means of forecasting is to analyse the underlying demand patterns and industry trends. On this basis, there are six major factors that suggest that the levels of exports are realistic.

First, the current market for non-alcoholic beverages in Asia is very large compared to the estimated increase of functional beverage exports from Australia. Because of the high population in Asia, the estimate is that Asian consumption is around six billion litres of still drinks (and probably as much again in carbonates). Therefore, a conservative estimate of the total market is around \$20 billion. If around five percent of the total non-alcoholic beverage market is attributable to functional beverages (as is the case in Australia) then the total market for functional beverages is around \$1 billion. Singapore itself has a non-alcoholic beverage market size in the order of \$400 million.

Second, the Asian region is already a major importer on non-alcoholic beverages and so is a national target market. Current import levels of non-alcoholic beverages in a range of countries are shown in the Table 3.1. The figures are derived from the United Nations COMTRADE database, and are converted to \$Aus from \$US using a conversion rate of \$US1 = \$AUS1.72.

Table 3.1

IMPORTS OF NON-ALCOHOLIC BEVERAGES IN SELECTED COUNTRIES (2000)

Country	Imports ('000)
Hong Kong	\$685,731
Japan	\$415,239
Singapore	\$130,778
Republic of Korea	\$36,263
China	\$7,879

Source: <http://www.intracen.org/tradstat/sitc3-3d/ip111.htm> accessed June 2002

Third, Asia is already a particular target market for Australian food and beverage producers, from agricultural produce through to processed and value-add products. A range of Commonwealth and State government initiatives have developed strategies to assist in increasing exports, providing avenues for producers to gain awareness for their products in Asia, and facilitating administrative requirements. For example:

- the Commonwealth has established the 'Supermarket to Asia'. The Prime Minister's Supermarket to Asia Council coordinates the business of government and industry to grow Australian food sales to Asia by developing a market-led culture, removing barriers, building points of product difference and improving competitiveness through the chain;⁵ and
- the Victorian and South Australian governments also have strategies in place (particularly targeted at agricultural production) to significantly increase food and beverage exports.

As a result of these strategies, there is considerable existing infrastructure, distribution networks, and development of the 'Australia' brand in Asian countries. This is likely to facilitate increases in exports into the future.

As discussed in previous sections, a significant barrier to export levels is the cost of transporting product which has high water content and is therefore high-volume and relatively low value.

Fourth, a source of opportunity for Australian exporters is the proximity of Australia to some of the destination markets, particularly vis-a-vis other potential suppliers. This means that Australian suppliers would have relatively lower costs. For example, Australian industry sources point to the success of exports of functional beverages from South Africa into Asia (particularly Singapore). Exports from Australia would have a significant cost advantage. This is important given the price-sensitive nature of the non-alcoholic beverage sector, particularly in Asian countries where incomes are lower.

⁵Source: <http://www.supermarkettoasia.com.au> accessed June 2002

It is instructive to consider the growth in NZ exports in recent years. Exports have risen from \$6.4 million in 1996 to \$62.7 million in 2000.⁶ This timeframe covers the period in which there has been strong growth in the functional beverages market.

Fifth, while some countries (such as Japan) have significantly matured markets, there is rapid existing and future growth in countries such as China. A recent Canadean report suggests that Asia is a significantly underdeveloped market, and that future strong growth can be expected in a number of countries.⁷ Selected forecast growth rates are shown in Table 3.2.

Table 3.2

**FORECAST BEVERAGE MARKET GROWTH RATES (2002 TO 2004) –
SELECTED COUNTRIES**

Country	Forecast growth (CAGR) 2002 to 2004
China	8.0%
Hong Kong	3.0%
Indonesia	17.8%
Malaysia	5.3%
Singapore	6.5%
Vietnam	30.1%

Source: Canadean Pty Ltd (2001), *Global Still Drinks 2001*

A number of other sources suggest significant growth in the Asian functional beverage market, including:

- a report by the Canadian Trade Commissioner Service suggests that the market is changing with rising health awareness, with the functional beverage sub-sector is a the fastest growing segment of the non-alcoholic beverages market.⁸ The report indicates that, “The growing popularity of fitness centres, along with increasing number of people partaking in sporting activities, have led to growth in the functional drinks subsector.” The report also lists some successful examples of exports from Canada in the functional beverages category;
- a Leatherhead Food Research Agency report reporting the significant growth of energy, health/wellness/nutraceutical drinks, vitamin/mineral drinks, and herbal drinks compared to the more established sports drinks market.⁹ It notes that the market for herbal drinks has doubled in volume between 1997 and 2000, with future rapid growth expected, and that in 2001 calcium-fortified lines accounted for a 20 percent share of the US chilled orange juice market; and

⁶ Source: <http://www.intracen.org/tradstat/sitc3-3d/ep111.htm> accessed June 2002

⁷ *Global Still Drinks 2001* Canadean Pty Ltd (November 2001)

⁸ Market Research Centre and the Canadian Trade Commissioner Service (February 2001) *The Processed Foods and Beverages Market in Hong Kong*

⁹ Leatherhead Food Research Agency (2001) *Functional Soft Drinks – A Global Analysis*

- the rapid growth of functional foods in the established market of Japan, where over 1,720 functional food products were launched between 1988 and 1998, with more than 55 percent of these introduced between 1996 and 1998.¹⁰ The functional beverages market shares a number of the same drivers as the functional food market.

The implication of such strong future growth prospects is that Australian exporters do not need to displace existing suppliers to achieve export gains, they simply need to share in the growth of the market as a whole.

Sixth, current Australian exports of beverages are extremely low, even in a sector where export potential is limited, with the implication that there are untapped export opportunities. Export levels are low relative to both:

- historical levels in Australia; and
- exports as a percentage of domestic production in countries around the world.

The level of imports into Australia (almost ten times higher than exports) is also indicative of the potential penetration that can be achieved into other markets.

Short-Run Net Impacts

Following the analysis of overseas markets and discussions with industry representatives, we suggest that:

- a 'low-export' scenario would be that the current export ratio applies to the increase in functional beverages market in Australia attributable to the introduction of a Standard. On this basis, the additional exports would be 1.5 percent of \$600 million — \$9 million per annum;
- a 'high-export' scenario might be five percent of the increase, which would imply exports of \$30 million. This scenario could be achieved if:
 - exports reverted to historical levels (exports have been as high as three percent of domestic production in the past five years); and
 - development of functional beverages in Australia led to a 'better-than-average' export performance. There is some industry belief that this is possible given the nature of the product and the market.

These calculations are based on the limit on exports deriving from the percentage of domestic production. One important check on the reasonableness of these calculations is whether the predicted additional exports are 'large' in relation to destination markets (ie, namely Asia), and they are not. In short, is it reasonable to expect that demand exists to take up the predicted level of exports.

¹⁰ Referenced in the Supermarket to Asia Council quarterly publication *Global Supermarket* Volume 5, Number 4, Summer 2001/02.

Employment will initially increase as a result of the increase in domestic production. An upper bound for the increase in employment as a result of introducing a Standard can be found by a pro-rata calculation using the increase in the functional beverage market attributable to the introduction of a Standard. In the previous section we calculated the increase in market size attributable to the Standard to be \$600 million. The pro-rata calculation works by calculating the output per employee, and applying this to the increase in production. Current domestic production is \$2.6 billion, with 6,000 employees in the industry, approximately \$433,000 per employee. An increase of \$600 million would on this ratio require around 1,380 additional employees. However, there is likely to be some existing spare capacity, and some 'fixed' nature of the production process given the capital intensive nature of the beverage manufacturing industry. Based on industry feedback about existing capacity levels, which are near to full capacity, it is likely that around 50 percent of the pro-rata increase would be required. This implies that there will be 690 additional employees due to the increase in domestic functional beverages production because of the new Standard. Of these, approximately ten to thirty five would be directly attributable to increased export levels.

3.2 Consumer Impacts

The introduction of the standard will result in certain benefits for domestic consumers, though the precise scale of such benefits is difficult to quantify.

The benefits to consumers arise from greater availability of choice, and better matching of their preferences. To the extent that consumption is directed away from other products toward functional beverages, this suggests that consumers are getting greater satisfaction from consuming functional beverages, so the result is improved overall happiness (or 'utility').

It is difficult to quantify these benefits, but they could be significant. An increase in the market for functional beverages of \$600 million. Based on a cost of \$6 per litre, and average consumption of 118 litres, this suggests around one million affected consumers. Even an improvement in consumer welfare valued at \$1 per consumer translates to significant benefits.

Some indirect indication of the value that consumers place on better meeting their own preferences is the time and effort consumers put into 'searching' for better products. For example, buying magazines, testing different products, asking friends. Given that individuals may value an hour of their own time at (conservatively) \$15, then the benefits from better matching of consumer desires can be valued quite highly. This is further reinforced by the notion that an average consumer may spend hundreds of dollars on functional beverages in the course of a year.

3.3 Other Impacts

Other indirect impacts are difficult to quantify in the main, but may include:

- increased R&D activity into the future as companies investigate issues surrounding the design and production of functional beverages. This activity may have implications for other research and have spin-off applications not initially expected;
- reduced instability in the export sector through the production of value-add products compared to the traditional Australian exports of raw materials and unprocessed commodities;
- potential health benefits and savings to the public purse if the production of functional beverages assists in combating diet-related disease. There is a reasonably tenuous link, involving changes in production patterns, changes in consumption patterns, and changes in health, but the magnitude of diet related disease costs means that very small changes lead to big benefits; and
- potential spillover benefits for other beverage exports because increased exports allows achievement of greater scale. Current lack of scale has been identified (eg, by IBIS Pty Ltd) as one of the major impediments to greater beverage export levels.

Section Four

The Long-Run Impacts of a Standard

The analysis in Section Three indicated that the development of the standard will result in (for Australia):

- increased domestic production and consumption — in the long term the economy-wide impact of this is likely to be neutral as it merely represents a shift in resources from one sector to another; and
- increased exports of functional beverages — this has clear short term benefits, but to some degree these benefits will be dissipated as the economy (eg, employment, the \$AUS, the terms of trade, and so on) adjusts.

Given the neutral domestic impacts, this section focuses on the long-run economic consequences of increased functional beverage exports. The impacts have been modelled using the MONASH model developed by the (CoPS) at Monash University in Victoria. The model works on the principle that the economy is initially in a 'steady-state' equilibrium, and returns to such an equilibrium in the long-run after any 'shock' or change to the economy (eg, an increase in the export of functional beverages) has occurred.

As noted in the previous section, the increase in exports initially will lead to increased employment in the beverages sector, greater output, and overall higher income (ie, GDP) in the economy as a whole.

In the longer term, however, the benefits will be somewhat dissipated throughout the economy. As a result, in undertaking the modelling we have adopted a standard comparative static long-run closure—national employment, the economy-wide rate of return on capital, and the trade balance are exogenously fixed to zero change.

Given these assumptions, the forecast macroeconomic impacts are shown in Table 4.1 in terms of both percentage and dollar changes for both the high and low scenarios identified in Section Three.

Table 4.1

FORECAST MACROECONOMIC IMPACTS

	Percentage Changes		\$ Changes	
	Effects of a \$9 million increase in exports	Effects of a \$30 million increase in exports	Effects of a \$9 million increase in exports	Effects of a \$30 million increase in exports
Real private consumption	0.00065	0.00218	2.7	9.2
Real public consumption	0.00062	0.00207	0.675	2.4
Real investment	0.00065	0.00218	0.9	3
Real exports	0.00044	0.00094	0.5625	1.3
Real imports	0.00236	0.00750	3.7125	11.6
Real GDP	0.00020	0.00065	1.35	4.2
Employment	0.00000	0.00000		
Capital stock	0.00020	0.00067		
Real wage rate	0.00096	0.00365		
Terms of trade	0.00161	0.00612		
Real devaluation of exchange rate	-0.00233	-0.00885		

Source: The Allen Consulting Group.

The outcome predicted in Table 4.1 is that real domestic absorption is up, the real exchange rate has appreciated, the real wage rate has risen, the terms of trade has improved, imports are up, exports are barely changed and there is relatively little response in real GDP.

Some explanation of these results are required:

- it may seem strange to argue that in the longer term employment does not change, but:
 - this comes about because the model assumes that in the long run employment is determined by demographic factors (ie, birth rates, death rates, migration intake, and so on) and that these factors are not affected by variations in beverage exports;
 - it is noted that to the extent that in the real world there is less than 'full-employment' initially then there will be greater significant long-term impacts. This is likely to be the case in this instance, particularly as the change is relatively small in the context of overall Australian GDP. The model calculations are hence conservative in nature, and the short term estimates may be more appropriate;
- the model assumes that in the long-run Australian investors are constrained by conditions in world capital markets (ie, they can borrow or lend at the going world-wide rate of return on capital). This rate of return is unaffected by variations in exports of beverages. We assume that in the long-run Australia's current-account balance is zero. Thus the trade-balance is unaffected by additional exports of functional beverages;

- it may also seem strange that additional exports of \$30 million or so do not create at least \$30 million of additional activity in the longer term. The key to understanding the impact is the concept of 'crowding out'. The story is as follows. When beverage exports expand, there is a tendency for the trade balance to move towards surplus. However, due to the constraint on the balance of trade, the model will not allow that to happen. The mechanism is appreciation of the real exchange rate. The real appreciation reduces the competitiveness of non-beverage exporters (eg, mining and primary agricultural producers) on world markets, and reduces the international competitiveness of Australian industries on local markets. Thus imports expand and non-drink exports contract. The contraction of non-beverage exports results in a terms of trade improvement (see Table 4.1). This is due to the presence of downward sloping world demand schedules for Australian exports (a real appreciation shifts the world supply schedule of Australian produces back and up the world demand schedules). The terms of trade improvement leads to higher real incomes for Australians, allowing additional private and public consumption (see Table 4.1). The improvement also allows the real wage rate to increase, which leads to additional capital creation in the long-run (again, see Table 4.1).

From an Australian perspective, the benefit associated with the increased functional beverage exports is best determined by summing the changes in the non-traded goods sector (ie, private consumption, public consumption and investment). Thus, the real benefits for Australia have an upper bound of \$14.6 million per year, and a lower benefit of \$4.275 million per year.

Because not all benefits are incurred in the same time-period, and because the value of money depends on when it is received or paid (a dollar today is worth more than a dollar in ten years because having a dollar now allows investment and the receipt of interest), it is misleading to make evaluations simply by looking at annual figures.

In order to gauge the overall benefit, an appropriate methodology is to calculate the Net Present Value (NPV) of the various benefits. This provides a representation in common units (ie, dollars) and in terms of current dollars that give a better indication of the magnitude. A number of data inputs and assumptions are required to undertake this analysis — these are shown in Table 4.2.

Table 4.2

MODEL INPUTS

Issue	Assumption
Time period	30 years
Discount rate — reflects the assumption made about the opportunity cost of funds	5.5 percent real
Benefits	As outlined in this report, using the MONASH modelling results

Source: Allen Consulting Group

One of the key inputs is the time period for the analysis. The analysis should in theory take into account all benefits attributable to the Standard being considered. This would suggest a long time period to evaluate the introduction of a Standard as benefits will arise in perpetuity (unless the Standard is subsequently revoked). However, two main factors lead to adopting a finite period:

- it is difficult to predict a long way in to the future what the actual benefits will be, with these being influenced by aspects such as changes in technology and underlying demand conditions; and
- the present value of future benefits becomes negligible after a certain period of time. For example, \$1 in fifty years time has a present value of around seven cents using a discount rate of 5.5 percent. In contrast, \$1 in thirty years time has a present value of twenty cents using a discount rate of 5.5 percent.

Present value calculations can be made based on the long-run impacts occurring each and every year over a thirty year horizon.

The NPV of increases in Australian GDP arising from exports is \$17.4 million to \$61.0 million. This assumes long run impacts of between \$1.2 million and \$4.2 million calculated over a 30 year time-period.

The more marked impact is on the domestic non-tradables sector. The PV calculation over 30 years takes the assumed long-run impact of between \$4.3 million and \$14.6 million to occur in each and every year over the 30 year period. The PV on this basis is between \$69 million and \$234 million.

Some indication of the regional impacts associated with the additional exports are provided in Table 4.3. It is clear that the benefits are concentrated in NSW and Victoria, although all other jurisdictions except Western Australia and the Northern Territory benefit.

Table 4.3

CHANGES IN REAL GROSS STATE PRODUCT (\$ MILLION)

	Effects of a \$9 million increase	Effects of a \$30 million increase
New South Wales	1.0125	3.5
Victoria	0.45	1.5
Queensland	0.225	0.6
South Australia	0.1125	0.3
Western Australia	-0.9	-3.1
Tasmania	0	0.1
Australian Capital Territory	0.1125	0.5
Northern Territory	-0.1125	-0.4

While the modelling is conservative in assuming that employment is fixed in the long-run, in the short-run the distribution of employment changes can be expected to mimic the distribution pattern shown in Table 4.3 (ie, all states and territories will benefit except for Western Australia and the Northern Territory).

Appendix A

The MONASH Model

This appendix provides an overview of the MONASH model used in Section Four and explains in detail some of the assumptions and frameworks that underly its application.

A.1 Overview

Since 1993, CoPS has developed MONASH, a dynamic computable general equilibrium (CGE) model of the Australian economy designed for forecasting and policy analysis. Like its predecessor, ORANI, MONASH has a high level of microeconomic detail. Unlike ORANI, it has a strong forecasting capability. This is due to:

- a more detailed specification of inter-temporal (ie, dynamic) relationships;
- greater use of up-to-date data; and
- enhancements that allow the model to take on information from specialist forecasting organisations and from recent historic trends.

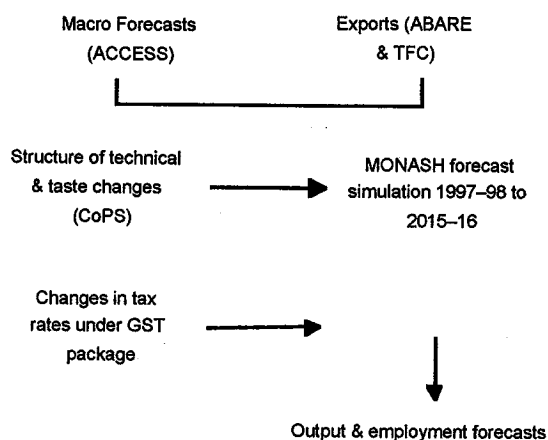
The key to generating believable forecasts is to use detailed information available from expert groups specialising in the analysis of different aspects of the economy. MONASH forecasts incorporate a wide variety of information including:

- macro forecasts from the Treasury and Access Economics;
- export forecasts from ABARE and the Tourism Forecasting Council; and
- forecasts of changes in technology and consumer tastes derived from trends calculated at CoPS.

These inputs are used in the forecasting system as shown in Figure A1.

Figure A1

THE MONASH FORECASTING SYSTEM



Using this information the model generates projections for 113 industries and 115 commodities. These can be transformed into projections for 860 sub-commodities, 341 labour occupations, 56 regions and many types of households.

A.2 The Structure of MONASH

The core equations of MONASH are based on the equation system of ORANI. ORANI is transformed into MONASH via the addition of:

- dynamic equations relating capital to past investment and investment to expected rates of return; and
- mechanisms that facilitate dynamic policy simulations such as allowing for a sticky real-wage response to an employment-damaging/enhancing policy shock.

The basic theoretical assumptions made in the MONASH model are as follows.

A.2.1 The Nature of Markets

Markets are assumed to be perfectly competitive. Competition guarantees that a level of output is produced in each industry at a point where the producer's price equals marginal costs and where zero pure profits are earned. Demand is assumed to equal supply in all markets except in the market for labour where oversupply is allowed. The government intervenes in a market by imposing sales taxes on commodities. This puts a wedge between the price paid by the purchaser and price received by the producer. The model also recognises nine margin commodities (wholesale trade, retail trade, road transport, rail transport, water transport, air transport, transport services, insurance and restaurants) which are required for each transaction involving a commodity or service. The costs of the margins are included in the price paid by the purchaser.

A.2.2 Input Demand for Industry Production

Two broad categories of inputs to the production process are recognised, intermediate inputs and primary factors (labour of various occupations, capital, agricultural land and working capital). Intermediate inputs are distinguished by commodity type and by source (domestically-produced and imported). Firms in each industry are assumed to choose a mix of inputs that minimises the costs of production for given input and output prices and for a given level of output. They are constrained in their choice of inputs by a production technology that combines intermediate and primary inputs to produce output.

A.2.3 Household Demands

The household determines the composition of consumption by choosing commodities (distinguished by source) to maximise a utility function subject to an expenditure constraint. A consumption function determines overall household expenditure as a function of household disposable income.

A.2.4 Input Demand for Investment

Given a level of investment expenditure, an industry chooses inputs (distinguished by type and by source) to minimise the costs of capital creation. The input-demand functions to capital creation are analogous to the input-demand functions for current production, with the exception that there are no primary factor inputs to capital creation.

A.2.5 Government Demands for Current Production

There is no explicit theory determining governments' consumption expenditures. These can be determined in one of three ways:

- endogenously, by a rule such as moving government expenditures with household consumption expenditure or with overall domestic absorption;
- endogenously, as a policy instrument which varies in order to accommodate an exogenously determined policy target such as a required outcome for the government's budget deficit; or
- exogenously.

A.2.6 Foreign Demand (International Exports)

MONASH is a single country model, and hence cannot explicitly model all of the determinants of foreign demand for Australian products. It handles export demand by imposing for each exported commodity a foreign demand schedule. These schedules, which relate the volume of exports to the foreign currency price of Australian products, are downward sloping. Hence, export volumes and foreign-currency prices can respond to changes in Australian supply conditions.

A.2.7 Capital Stocks, Investment and Rates of Return

MONASH allows for two broad treatments of capital and investment. The first, involving explicit assumptions about movements in rates of return and investment/capital ratios, is suitable for comparative-static simulations. In such simulations, we are concerned with the effects of a policy or other shock after considerable time, say seven years. In these circumstances, MONASH allows the user to assume that the shock under examination does not affect rates of return. Thus, industries favoured by the shock attract capital until their rates of return are driven down to their initial levels and that industries for which the shock is unfavourable lose capital until their rates of return increase to their initial levels. Having, in this way, tied down the long-run effect of the shock on capital stocks, the effect on investment by industry can then be determined by assuming no change in investment/capital ratios.

The second broad treatment of capital and investment in MONASH involves explicit capital supply functions, and is used in year-to-year simulations (ie, simulations tracing out the paths of variables for years t , $t+1$, $t+2$, etc). While the assumption of no change in rates of return may be suitable for long-run analysis, it is unrealistic to assume that movements in an industry's rate of return are eliminated by year-to-year movements in the industry's capital stock. In each year of year-to-year simulations, industries' capital growth rates (and thus investment) are determined according to functions which specify that investors are willing to supply increased funds to industry j in response to increases in j 's expected rate of return. However, investors are assumed to be cautious. In any year, the capital supply functions in MONASH limit the growth in industry j 's capital stock so that disturbances in j 's rate of return are eliminated only gradually.

A.2.8 Equations for Facilitating Dynamic Policy Simulations

There are a number of mechanisms in MONASH introduced to facilitate dynamic policy simulations. Probably the most important mechanisms relate to wage and employment adjustment in the labour market. In comparative static analysis, one of the following two assumptions is made about the operations of the labour market:

- real wages adjust so that any policy shock has no effect on employment;
or
- real wages are unaffected by the shock and employment adjusts.

MONASH, however, allows an intermediate position for year-to-year policy simulations. In MONASH, real wages can be sticky in the short run but flexible in the long run and employment can be flexible in the short-run but sticky in the long run. More specifically, for year-to-year policy simulations it is assumed that the deviation in the real wage increases in proportion to the deviation in employment from its base case-forecast level. The coefficient of adjustment is chosen so that the employment effects of a shock are largely eliminated after eight to ten years. This labour market is consistent with macroeconomic modelling in which the non-accelerating inflation rate of unemployment (NAIRU) is exogenous.