Submission
No 12

INQUIRY INTO SKILLS SHORTAGES IN RURAL AND REGIONAL NSW

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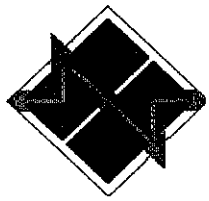
Theme:

Summary

National Economics



How we can help you

www.nieir.com.au

Regional Modelling

Public and private sector managers need to know more about the dimensions of national growth and its regional pattern. National Economics' forecasts provide estimates of how much growth and when it will occur, while the regional modelling details where this growth will occur.

Australia is a relatively small component of the international economy. At the national level Australia's economic growth is closely linked to growth in the world economy. National Economics' models make the links between international, national and regional trends.

Projections of population growth, economic growth and local expenditure can be developed for regions within all parts of Australia, thus providing business and government with a powerful planning tool.

Using Regional Modelling

The regional models can be used to evaluate likely growth within regions and also the potential impact of infrastructure and business investment upon a region.

National Economics' regional models are used to:

- evaluate the impact of proposed investments, particularly as part of Environmental Impact Studies;
- to evaluate where market growth will be concentrated, thus providing a picture of where to locate infrastructure and/or retail facilities;
- to evaluate the market potential of existing facilities; and
- to assist in the valuation of regional business activities.

In the public sector the regional modelling has been used to:

- evaluate the impact of regional infrastructure development programs;
- assist in development of regional planning schemes;
- provide base projections for regional strategies; and
- evaluate alternative development strategies.

The capacity to model regional growth can be harnessed to evaluate marketing decisions, and to ensure that public economic development and human development programs are clearly matched to regional needs.

National Economics' regional expenditure analysis can be used to develop and evaluate marketing strategies, to assess performance of companies within specific regional markets, provide a clear socio-demographic profile of existing customers and identify potential markets with metropolitan areas.

National Economics

The National Institute of Economic and Industry Research (NIEIR), trading as National Economics, was founded in 1984 as a private economic research and consulting group serving clients in the public and private sectors. NIEIR clients include many of Australia's largest and most dynamic corporations and government departments.

The work of the Institute is divided into two streams, one financed by subscriptions and the other by commissioned consultancy advice, studies and reports. The streams are complementary in that much of the consultancy work uses as background the economic forecasts and projections prepared for subscribers while in turn the detailed sectoral knowledge often gained in consultancy work is fed back into the models which underlie the Institute's forecasts and projections.

Capabilities

With over 20 years experience in applied economic and consultancy work National Economics has built up a considerable body of intellectual capital, both in terms of the expertise of its staff and the data sets and econometric analyses available for application to clients needs. A major part of this capital is the Institute's IMP modelling suite, a range of powerful forecasting and analysis tools which give National Economics "leading edge" capability in national, state, regional and local area economic and business analysis. Other formal models include:

- national and state quarterly, medium and long term models producing forecasts from six quarters to 30 years ahead;
- an energy sector model with greenhouse impact and electricity load curve projection capability;
- international and trade models;
- economic activity "leading indicator" models;
- microsimulation models for assessing household level economic activity and the distributional consequences of short term policy changes, and local area consumer demands down to groups of 200 to 300 households;
- detailed industry modelling with forecasting sectors (130 industry sectors);
- regional models and forecasting covering all regions in Australia down to the Statistical Division level; and
- models projecting equity market performance indicators at the industry level.

Purpose built models are developed for specific consulting projects covering areas such as privatisation, regional development, policy and strategy analysis, infrastructure planning and cost-benefit analysis.

These capabilities will continue to be critical to the development of competitive advantage for NIEIR clients as increasing domestic and international competition together with deregulation and privatisation brings more and more of Australia's economic activity to the rigours of detailed analysis.

National Economics' services include:

- Regional economics and forecasting with a special focus on assisting local government.
- Energy forecasting, facility audits and energy cost management.
- SpendInfo – Household expenditures and demographics.
- Industry reports and market evaluations.
- Reports and forecasting for all levels of government.
- Environmental analysis.

For further information please contact Peter Hylands on (03) 9488 8444 or peterhylands@nieir.com.au

National Economics
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416 Queens Parade, Clifton Hill, Victoria, 3068

The Regional Models

National Economics has essentially three regional models. The State (SIMP) and Regional IMP (RIMP) models are used for forecasting state and regional activity, and assessing state and regional impacts. The Regional Household Information System (RHIS) uses microsimulation techniques to distribute estimates of household expenditure and incomes to regions as small as 200 households (Census Collectors Districts).

The regional IMP model uses data developed by RHIS to estimate regional household expenditures.

The state models provide estimates and forecasts of state economic activity on both a quarterly and an annual basis. Both models are based upon the detailed ABS state accounts with the quarterly model focusing on the coming two years harmonised with the annual state model. The annual model incorporates a detailed industry disaggregation and input-output structure. The dynamic input-output modelling used in this structure allows for detailed impact assessments to be made which identify first-round and flow-on impacts.

National Economics' integrated model of the eight Australian States and the integrated models of the Local Government Areas (LGAs) in each State. Both model types have the same structure as each State/LGA model, is built around a 100 industry input-output structure with each industry in each State/LGA linked to the same industry in every other State/LGA by interstate/inter-regional trade matrices. The models for each State/region are fully specified by employment, investment, exports, imports (international/interstate), household income generation function, etc. The models contain over 400,000 variables.

Model outputs

The state and regional IMP models provide estimates of:

- population growth;
- dwelling commencements;
- housing stock;
- employment by industry;
- output by industry;
- gross regional product; and
- estimated consumption expenditure.

The models' results allow for inter-regional comparisons to be made and for sensitivity analysis of investment policy options.

Regional Planning and Consultancy

National Economics is well placed to analyse the economic impact of government at the regional and local level. Topics covered include the following:

- regional, LGA and local incidence of Commonwealth taxes, social security payments and other major benefits including Medicare;
- regional, LGA and local incidence of state taxes and services, including health and education services;
- local public finance, including rate and grant revenues, user charge opportunities and expenditure requirements;
- design of service eligibility criteria; assessment of take-up, and planning service delivery locations; and
- impact of Commonwealth, state and local developmental programs.

Past projects have included:

- drafting fiscal strategies at Council and regional authority level;
- analysis of Council investments and asset management, particularly roads;
- costing and strategy development for particular services, e.g. waste management; and
- development of economic development strategies for Council and/or regional authority implementation.

Background for all projects is provided by National Economics' extensive local area database.

Regional Development Strategies

National Economics has assisted in the development of regional economic and social development strategies:

- in regions ranging from Western Sydney to remote parts of the Northern Territory;
- where the driving force varies from the encouragement of sophisticated export-oriented manufacturing to niche-market agriculture and gold mining; and
- for private sector clients ranging from large investors to local community groups, and for public sector clients ranging from local government through regional agencies to state and Commonwealth agencies.

How we can help you

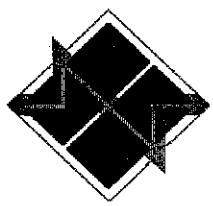
Past projects have included:

- cost-benefit studies associated with applications for concessional finance and other government support;
- assessment of the economic costs and benefits of alternative environmental management plans;
- assessment of local job generation and distributional effects of major projects, including advice as to how to reconcile maximisation of local benefit with project performance; and
- analysis of the role of education in maximising local economic opportunities.

YourPlace regional profiles are based on Local Government Areas. *YourPlace* combines a variety of indicators and analytical tools which help to identify and describe the relevant issues and provide a context for local government and business. *YourPlace* includes national and regional trends, regional and State benchmarks and local area indicators. Profiles can be created identifying critical information including a summary of the state of any region, population statistics, local indicators and spending patterns.

YourPlace has been created by National Economics and combines with the *State of the Regions* reports to form a powerful strategic information source for local government.

You can order the complete version of *YourPlace* now or by requesting the *YourPlace* demo you will be granted access to www.nieir.com.au and be able to order instant and individual data sets to suit your needs.



National
Economics

YourPlace Pricing Information

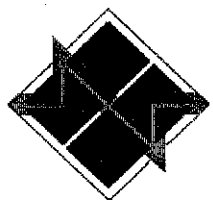
Household Dimension	Selected LGA (s)		All LGAs in State of selected LGA (s)		All LGAs in Station of selected LGA (s)		All LGAs in Aust. (s)	
Household growth	50	☐	55	☐	75	☐	100	☐
Prosperity potential	30	☐	35	☐	45	☐	60	☐
Socio-economic dynamism	30	☐	35	☐	45	☐	60	☐
Population growth	50	☐	55	☐	75	☐	100	☐
Income earning age profile	50	☐	55	☐	75	☐	100	☐
Aged services	50	☐	55	☐	75	☐	100	☐
Job readiness	100	☐	110	☐	155	☐	200	☐
Resident jobs from national growth	50	☐	55	☐	75	☐	100	☐
Wealth	50	☐	55	☐	75	☐	100	☐
Resilience to interest rises and income falls	75	☐	85	☐	115	☐	150	☐
Debt affordability	50	☐	55	☐	75	☐	100	☐
Labour utilisation	100	☐	110	☐	155	☐	200	☐
Progression to full employment	50	☐	55	☐	75	☐	100	☐
Industry Dimension								
Local employment provision	50	☐	55	☐	75	☐	100	☐
Industry growth	75	☐	85	☐	115	☐	150	☐
Output per capita	50	☐	55	☐	75	☐	100	☐
Retained retail spending	100	☐	110	☐	155	☐	200	☐
Knowledge driven growth potential	50	☐	55	☐	75	☐	100	☐
Global knowledge flows	50	☐	55	☐	75	☐	100	☐
Industry structure for future growth	50	☐	55	☐	75	☐	100	☐
Structural employment dynamism	50	☐	55	☐	75	☐	100	☐
Industry jobs from national growth	50	☐	55	☐	75	☐	100	☐
Regional Foundation Dimension								
Community welfare	50	☐	55	☐	75	☐	100	☐
Lifelong learning	50	☐	55	☐	75	☐	100	☐
Lifestyle choice	50	☐	55	☐	75	☐	100	☐
Infrastructure	100	☐	110	☐	155	☐	200	☐
Low skilled and clerical	60	☐	65	☐	90	☐	120	☐
High skilled residents	60	☐	65	☐	90	☐	120	☐
Additional Data								
GRP	400	☐	650	☐	1200	☐	2,000	☐
Cluster Analysis	165	☐	220	☐	275	☐	330	☐
SpendInfo 50	275	☐	495	☐	605	☐	1,430	☐
Demographic profile	165	☐	330	☐	495	☐	660	☐
Social Security Profiling	550	☐	715	☐	1,320	☐	1,980	☐
Closest10 (all indicators)	495	☐	605	☐	825	☐	935	☐
Output / Value Added 3 digit	**Available only with the complete version of YourPlace**							
5 towns (ratings + Social Sec)	660	☐	990	☐	1,430	☐	2,200	☐
YourPlaceIO (bundled)	2,200	☐						
SOR Profiles 2001	220	☐	330	☐	440	☐	770	☐
SOR Profiles 2002 (including Creativity)	330	☐	440	☐	880	☐	1,650	☐
SOR Profiles 2003	330	☐	440	☐	880	☐	1,650	☐
Total value	**5,220**		**7,015**		**10,820**		**16,865**	
Bundled price with all components	**4,400**		**5,500**		**6,600**		**7,700**	
Bundled All inc YPIO (single LGA)	**6,050**		**7,150**		**8,250**		**9,350**	
PLEASE SELECT YOUR LGA:								

State of the Regions on CD 1998 – 2002

You can now order the complete set of previous *State of the Regions* reports on CD for just $396 including GST.

This is an opportunity to acquire, in one product, the essential and comprehensive review and analysis of the economic and development issues confronting regional Australia, including:

- Employment
- Structural issues
- Innovation in regional development policy
- Impacts of national policy
- Knowledge based economies
- Inequality of regions
- Impact of globalisation on regions
- Governance and regional development
- Comprehensive regional performance indicators



National Economics

YourPlace

The place to go for the performance of Australia's local economies

Australia's leading application for measuring a region's performance and future prospects

Your link to all the *State of the Regions* reports

National Economics
www.nieir.com.au

YourPlace – The strategic planning tool for local government

Completely revised and updated

- Brings together all information presented in the previous 'State of the Regions' reports at the local government area level.
- Combines a variety of indicators and analytical tools which help to identify and describe the relevant issues and provide a context for local government and business.
- Includes national and regional trends, regional and state benchmarks and local area indicators.
- Profiles can be created identifying critical information including a summary of the state of any region, population statistics, local indicators and spending patterns.
- Includes comprehensive regional profiles covering all local government areas.
- Identifies and describes the relevant issues impacting strategic planning and decision making for local government across Australia.

How to purchase *YourPlace*

- Obtained your free browser from National Economics and then purchase *YourPlace* in the following ways –
- Purchase the complete product for $7,700 including GST
- Purchase the complete product plus the region specific input-output software for $9,350 including GST
- Purchase individual data sets to meet your needs – see the detailed order page – by selecting your LGA and ordering the data you require. Individual data sets can be purchased for as little as $30
- You have purchased individual data sets and you now wish to purchase the complete *YourPlace* product – the amount you have spent so far on individual data sets will be deducted from the full price of *YourPlace*

For further information please contact Peter Hylands on
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YourPlace: Introduction

YourPlace software provides detailed economic information on all Local Government Areas (LGAs) in Australia. It enables industry practitioners to view a broad selection of indicators designed to create a comprehensive snapshot of a regions' economic performance and future prospects. It is an invaluable tool for councils, community organisations, government agencies, market researchers and investors to view how 'their' region performs in 28 specially designed indicators that capture economic capabilities and prospects.

The application includes data for each of the Local Government Areas throughout Australia and covers each of the years 1991, 1996, 1998 and 2001. Detailed trend analysis, regional comparisons and access to underlying data enable practitioners to acquire a detailed picture of a regions performance.

This latest release of *YourPlace* has been completely rewritten to conform to Windows application user-interface standards and provides seemless integration with the National Economics website (www.nieir.com.au). Additional features which have been included in the current version include the ability to:

- create, analyse and graph customised regions;
- export data to Microsoft Excel or text file formats for further analysis;
- generate MapInfo workspace files to view states as thematic maps;
- view detailed 3 digit ANZSIC output either graphically or in report format;
- view detailed household expenditure patterns for a range of spending items;
- view detailed supplementary data either graphically or in report format;
- export reports in Excel, Access, Rich Text, Text, HTML, Snapshot or XML formats;
- print the latest available State of the Regions report for each LGA;
- launch Internet Explorer and view each LGA's website; and
- purchase and download a range of additional economic data from the National Economics website.

This overview gives a brief explanation of terms and concepts used throughout the program and explains the purpose and functionality of each menu item. The menu system has been structured to give the same look and feel as traditional Microsoft windows applications. Most commands can be accessed from either the standard menu bar or attached toolbar.

YourPlace: Menu System

File Menu

- ***Export ...Export to Excel:*** Allows data from the Regional Summary form to be saved as an Excel file.
- ***Export ...Export to Notepad:*** Allows data from the Regional Summary form to be saved as a text file and viewed in Notepad.
- ***Export Report:*** Enables the saving of reports as either an Access, Excel, text, RTF, HML or snapshot format, this option will only be enabled when a report is in print preview mode.
- ***Customise Region:*** Allows customised regions or combinations of LGAs to be created. Data will then be available for the region on both the Regional Summary and Output forms.
- ***Print Preview:*** Displays a report in Print Preview mode. A report can only be printed from Print Preview mode.
- ***Print:*** Allows printing of reports from Print Preview mode.
- ***Close Database:*** Closes *YourPlace* and restores the standard Access menu system.
- ***Exit:*** Closes both *YourPlace* and Access.

Analysis Menu

- ***Regional Summary:*** Displays summary statistics for a selected LGA, customised region, Statistical Division or state for each of the 28 available indicators.

  These indicators are grouped into three dimensions, namely:

  (i) the household dimension;

  (ii) the regional foundation dimension; and

  (ii) the industry dimension.

  The household dimension captures the diverse determinants of economic behaviour at the household level. The dimension attempts to measure the broad areas of demographics, wealth, income and labour force.

  The industry dimension for example, comprises of indexes that cover the topics of employment, industry structure, expenditure and macro economic risk at the local government level.

  The regional foundations dimension focuses on the skills base, education, welfare and infrastructure development of a region. It is an attempt to measure the attractiveness of a region to investment and social infrastructure.

  The idea behind the tridimensional analysis is to present a snapshot of economic, socio-demographic and environmental characteristics within a local government area.

- ***Underlying Data:*** Forms the base or raw data series from which the indicator scores are derived (further details are provided on the technical documentation available from the help menu).

  Indicator Scores – Are derived from the underlying data and constructed so the value lies between 0 and 100. The score only implies that when making comparisons between regions, the higher the score, the better the performance in respect of that indicator

  Ranking – Is the ranking of the LGA with respect to all other LGAs in Australia.

  Dimension Score – Is an overall score for a region calculated with reference to the scores achieved for each indicator within a given dimension. Again, the higher the score, the better the overall performance of the region.

- ***Population Profile:*** Provides detailed statistics on employment, households, population and income since 1981.

- ***Household Spending Profile:*** Calculates average amount spent, per week, per household for a range of spending items. The report is available either by LGA, statistical division, state or Australia wide. The spending items available are shown in the following table.

Household Spending Items			
1	Alcohol	25	Jewellery
2	Audiovisual, Computer & Entertainment Equipment	26	Meat
3	Audiovisual, Computer & Entertainment Media	27	Men's Clothing
4	Baby Goods	28	Miscellaneous
5	Bakery Products	29	Miscellaneous Foods
6	Bedding, Linen & Towels	30	Movies, Theatre & Cultural Activities
7	Children's clothing	31	Nursery Products
8	Dairy	32	Pets
9	Drinks (non-alcoholic)	33	Professional fees
10	Eating out	34	Public Transport
11	Education	35	Recreation & Sport
12	Floor Coverings	36	Repairs
13	Footwear	37	Seafood
14	Fruit, Vegetables & Nuts	38	Services
15	Fuel & Power	39	Stationary, Books, Mags, Newspapers
16	Furniture	40	Telecommunication
17	Gambling	41	Tobacco
18	Hardware & homewares	42	Toiletries
19	Health Products	43	Vehicle Products
20	Health Services	44	Vehicle Purchase
21	Holidays	45	Vehicle Services
22	Household textiles & ornaments	46	White goods & appliances
23	Housing, Housing Costs, Repairs & Investment	47	Women's Clothing
24	Insurance (Home, Contents, Vehicle, Registration and Licensing)		

- ***Closest Performers:*** Shows a comparison of a reference LGA with 10 other similar performing LGAs. The closest LGAs are determined by considering their relative performance across each Indicator with respect to the performance of the reference LGA.

- ***Industry Output:*** Shows ANZSIC 1 digit, 2 digit and 3 digit industry output for each LGA, customised region, statistical division or state. The values can be displayed as either numeric or as a percentage. The percentage value refers to the proportion of a regions total output. For example, the value of Armidale's (NSW) Agricultural output represents 3 per cent of that regions total output during 1998.

  Statistical divisional (SD) data will only be shown where data exists for all regions within the SD. State total will always be displayed.

- ***Generate MapInfo Map:*** This command will only be enabled when the Regional Summary form is displayed. A MapInfo workspace file containing the underlying values is created and stored in the '*installation*\Mapping' folder. This workspace file can then be opened in MapInfo to display a thematic state map highlighting the regional differences in respect of the active indicator.

- ***Clustering:*** Clustering is a statistical technique which groups like characteristics and presents them in a predetermined number of clusters. The clustering within YourPlace assesses the scores achieved in each indicator and creates groups of LGAs that have similar values for each indicator across all indicators included in a given dimension. The resulting cluster will therefore consist of LGAs facing the same broad range of economic issues. The tables below show the types of clusters within each dimension.

Household Dimension			
1	Low population growth, weak prosperity potential, good debt affordability	5	Strong employment performance, Income growth, productive age profile, low prosperity potential
2	Ageing, low population growth, low prosperity potential, hard working, poor job prospects	6	Wealthiest, most secure, high prosperity potential, good employment performance, future growth
3	Low population growth, low wealth, vulnerable to downturn, strong prosperity potential	7	Lowest debt affordability, most vulnerable, moderate wealth and employment performance
4	Moderate to high wealth, good job prospects, low debt affordability, population growth	8	Low wealth, weak employment performance, low job readiness, poor income growth

Industry Dimension			
1	High concentration dynamic employment centre.	5	Moderate job creation. Good local job provider. High retained retail spending.
2	Job deficit. Industry focus. Low retained retail spending.	6	Low skill. Unstable industry structure. Likely job losses.
3	Progressive skills. Moderate Output per Capita. Job loss and low growth rates.	7	Low skill. Job deficit. Stable industry structure.
4	Low growth mature industry focus. Low retained retail spending. Job deficit.	8	Stable employment and retail base. Low risk industry structure

Local Foundation Dimension			
1	Strong all-round foundations	5	Moderate strength foundations
2	Moderate to weak foundations with strong lifestyle services infrastructure	6	Least developed local foundations
3	Weak foundations with moderate infrastructure strength	7	Moderate foundations with relatively strong human capital

Industry Type Dimension			
1	Integrated agricultural centre	5	Primarily mining
2	Advanced manufacturing	6	Integrated production and service economy
3	Primarily business services	7	Broad manufacturing with retail and business support
4	Integrated value adding resource centre	8	Primarily agriculture

The percentage value shown on the cluster summary form represents the degree of association or likelihood of a region belonging to a given cluster. The region is then said to belong to that cluster which has the highest percentage value.

- ***Supplementary Data:*** Displays additional data used in deriving the indicator scores that are displayed on the Regional Summary form. For example, the value of wealth used to derive the wealth indicator is defined as the total wealth of households in terms of financial assets (excluding superannuation), housing values and the value of unincorporated business assets owned by the household average household wealth.

Charts Menu

- ***Indicator Values:*** Allows graphing of indicator scores and will only be activated when the Regional Summary form is displayed. The resulting graph is fully customisable, enabling the user to view all LGA's and customised regions for each indicator since 1991.
- ***Supplementary Data:*** Allows graphing of supplementary data and will only be activated when the Supplementary data form is displayed.

Resources Menu

- ***2001 State of the Regions Report:*** Prints the 2001 State of the Regions appendices data for a selected LGA.
- ***2002 State of the Regions Report:*** Prints the 2002 State of the Regions appendices data for a selected LGA.
- ***2003 State of the Regions Report:*** Prints the 2003 State of the Regions appendices data for a selected LGA.

- ***State of the Regions*** Report for the years 1998 – 2002 are available from National Economics on CD Rom.

Local Government

- ***LGA Resources:*** Displays a LGA website in Internet Explorer.

National Economics

- ***National Economics Website:*** Displays National Economics' website in Internet Explorer. This link allows the user to select from a large database of economic data which can then be displayed and analysed within the YourPlace application.
- ***Import Additional data from National Economics:*** This menu item imports additional data into YourPlace after purchasing it from the National Economics' website.
- ***View Additional and Data Series:*** Allows the user to view complete details of indicators, rankings, underlying data and additional non-YourPlace data. The series can be viewed by LGA only, SD, State or Australia wide (depending upon data availability).
- ***Publications:*** Displays a list of up to 7 word/pdf documents which have been stored in the YourPlace home directory.

Help

Overview: Displays this help document.

YourPlace provides the following series of economic indicators.

Indicator	*Underlying Economic Series*
Household Dimension	
Aged services	% difference between number of beds available & number of people over 60
Debt affordability	RANK(Wealth) - RANK(Macro)
Household growth	50% HH Income Growth + 50% Employment Growth
Household growth	Employed persons ratio
Household growth	Average income
Household growth	Growth in employed ratio
Household growth	Growth in average income
Income earning age profile	Rate of growth of total population
Income earning age profile	Rate of growth population aged 65 and over relative to overall population growth
Income earning age profile	Rate of growth in population over 65
Job readiness	Working age population
Job readiness	Non-job ready population
Job readiness	Ratio of non-job ready population to working age population
Labour utilisation	Ratio of potential working hours to hours actually worked
Labour utilisation	Total hours worked
Labour utilisation	Population aged 15-65

Indicator	*Underlying Economic Series*
Labour utilisation	Available (potential) working hours
Population growth	Population
Population growth	Expected population growth
Progression to full employment	Change in LU
Prosperity potential	Estimated household prosperity and absolute household growth
Resident jobs from national growth	Actual change in workers in the LGA
Resident jobs from national growth	Estimated change in workers in the LGA
Resident jobs from national growth	Number of workers in the LGA
Resident jobs from national growth	Estimated Resident Jobs growth rate in the LGA
Resilience to interest rises and income falls	Debt service ratio
Resilience to interest rises and income falls	Savings rate
Resilience to interest rises and income falls	Household disposable income
Socio-economic dynamism	Level of variation in income and employment growth rates over time
Wealth	Total $ value of household assets (less debts owing).
Industry Dimension	
Global knowledge flow	Global Knowledge Flow occupations
Global knowledge flow	Ratio of global knowledge workers to total workers
Industry growth	Output by industry
Industry growth	Growth in output per capita
Industry jobs from national growth	Estimated local jobs growth rate in the LGA
Industry jobs from national growth	Number of workers
Industry jobs from national growth	Estimated change in workers
Industry jobs from national growth	Actual change in workers
Industry structure for future growth	Percent likely to benefit by change in employment
Industry structure for future growth	Change in employment
Industry structure for future growth	Employment by industry
Knowledge Driven Growth Potential	Ratio of Symbolic Analysts to Routine Workers
Knowledge Driven Growth Potential	Number of Routine Workers
Knowledge Driven Growth Potential	Number of Symbolic Analysts
Local employment provision	Resident population
Local employment provision	Ratio of local jobs to resident population
Local employment provision	Local jobs
Output per resident	Total output ($Mil)
Output per resident	Output per capita
Retained retail spending	Percent retained (i.e. retail spending from within the LGA)
Retained retail spending	Total household spending ($Mil)
Structural employment dynamism	Percent effected by change in employment
Structural employment dynamism	Employment by industry
Structural employment dynamism	Change in employment

Indicator	Underlying Economic Series
Local Foundations Dimension	
Community welfare	% Health workers versus population
Community welfare	Total population
Community welfare	Number of health workers
High skill human capital	Number of high-skilled workers
High skill human capital	Ratio of high skilled workers to total workers
High skill human capital	Total workers
Infrastructure	Ratio of total floor area (non residential building) and total population
Life-long learning	Percent of residents undertaking further studies or training
Lifestyle choice	Ratio of Lifestyle Industry output ($m) to total LGA output ($m)
Lifestyle choice	Lifestyle Industry output $M
Lifestyle choice	Total output ($m)
Skills sustainability	Total Workers
Skills sustainability	Ratio of low-skilled & clerical workers to total workers
Skills sustainability	Number of low-skilled & Clerical workers

YourPlace-IO

National Economics has pioneered the development of region specific input-output tables with the creation of *YourPlace-IO*. The*YourPlace-IO* makes possible the analysis of the impact of new investment proposals and the contraction of local industries on the local economy.

The input-output multipliers are important tools for analysts and provide a way of answering some of the questions often asked by economists and managers. These queries tend to arise because of the types of 'what if?' analysis for which input-output tables can be used.

An example is, what would be the impact on employment of an x per cent change in output by the chemicals manufacturing industry? Using input-output tables, multipliers can be calculated to provide a simple means of working out the flow-on effects of a change in output in an industry on one or more of imports, income, employment or output in individual industries or in total.

Basic Structure of Input-Output Tables

Industry to industry input/output table

From \ To		Intermediate demand				Total	Final demand	Exports	Total supply
		Mining	Manufacturing	Construction	Services		Public and private		
Intermediate inputs	Mining	Intermediate usage Q1					Final demand Q2		
	Manufacturing								
	Construction								
	Services								
Primary inputs	Wages & salaries	Primary inputs to production Q3					Primary inputs to final demand Q4		
	Gross operating surplus								
	Taxes								
	Imports								
Australian production									

The diagram describes the basic structure of an industry by industry table with direct allocation of imports. Flows between industries are shown in quadrant 1 (Q1), called intermediate usage. Each column in this quadrant shows the intermediate inputs into an industry in the form of goods and services produced by other industries and each row shows those parts of an industry's output which have been absorbed by other industries. For example, the intersection of the first column (mining) and the third row (construction), indicates how many goods and services are used by the mining industry from the construction sector to produce mining output.

The intermediate usage quadrant and the final demand quadrant (Q2) show the total usage of goods and services supplied by each industry. Quadrants 1 and 3 together show the inputs used to produce the total supply (outputs) of each industry.

Final demand (Q2) represents the total level of demand for products (of industries) by households, business and governments. This includes both consumer and capital goods and services. Also goods and services produced for consumption overseas, exports, are included here.

Primary inputs to production (Q3) includes the proportions of labour, profits, taxes and imports used to produce the total supply of output of each industry. Wages and salaries are the labour component whilst gross operating surplus (GOS) is akin to profit. Taxes include all net government taxes on production. Also included are imports which are used as inputs to production by domestic companies.

As mentioned earlier, the diagram shows the input-output relationships using direct allocation of imports. Basically imports can be treated in two ways, either directly or indirectly. The direct allocation of imports method treats imports as a separate item and imports used as inputs are factored in as a separate line item. That is, as they are shown in the last row in primary inputs. In this case quadrants 1 and 2 refer only to the use of domestic production and consequently quadrant 1 does not reflect the technological input structure of the economy. Indirect allocation of imports involves recording all imports as adding to the supply of the industry in quadrant 1. Depicted in this way the amounts of inputs into one industry supplied by each other industry reflect the true technological relationships between all inputs into the industry.

A simple application of the input-output table is calculating inputs as a percentage of the output of an industry and using these percentages for any given level of output of that industry. In the diagram this is done by using quadrant 1 and 3 divided by Australian production in a given industry. The individual results are referred to as direct input-output coefficients.

These coefficients however do not tell the complete story. For example, in order to produce output from the chemicals industry inputs are required directly from the mining industry. To supply this direct requirement, the mining industry itself requires inputs from the chemical industry. To produce this indirect requirement of the mining industry, the chemical industry needs, in turn, additional output from the mining industry and so on in a convergent infinite series. This example is isolated to two industries. When the inter-relationships of all industries in the economy are considered the direct input-output coefficients have major shortcomings. This is not to be confused with the direct allocation of imports which is a separate issue.

What, therefore is needed are total requirements coefficients. This is done by tracing, step by step, throughout the industrial structure, until the increments of output required indirectly from each industry become insignificant. If this operation is carried out for all industries and the direct and indirect requirements are added together, a matrix of total requirement coefficients is obtained. This process is done on a computer using matrix inversion.

Using Input-Output Tables in Analysis

The following section describes the practical uses of input-output analyses. The Australian Bureau of Statistics (ABS) collects the input-output tables which represent the flow of goods and services between industries. The basic tables and the industry-by-industry tables provided by the ABS are essentially an accounting record of the flows in the national economy. Using simplifying assumptions the input-output estimates can serve many analytical purposes.

Regional Input-Output

Input-output information is available for the Australian economy as a whole and using this information, a system of building blocks is created which describes, for a product (or more commonly combination of products):

- its origin or source of supply divided into domestic production and imports;
- its destination classified into usage by various industries and final demand categories; and
- the difference between the basic price and the purchasers price for each product or margin.

National Economics has developed the region specific input-output tables with the creation of YourPlace-IO. The geographical unit of analysis is the local government area (LGA) and up to 7 LGA's can be aggregated to create a regional economy.

This process can broadly be explained in four steps and is undertaken for every region. These steps are explained below.

1 Prepare the national indirect allocation of imports table.

2 Gather all economic data on the region of interest, including industry output and consumption expenditure.

3 Analyse the regions industries input requirements given its output.

4 See how much of this input requirement can be sourced from local production.

The input-output tables are estimated for the 106 industries in the national input-output tables prepared by the Australian Bureau of Statistics (ABS). The ABS tables have 107 industries. However, data limitations forced aggregation of two: the agriculture and livestock industries. YourPlace-IO uses the YourPlace data estimates for each LGA for:

- private consumption expenditure for 400 categories;
- construction expenditure;
- equipment expenditure;
- government consumption expenditure; and
- industry output.

YourPlace-IO estimates exports and imports by 106 industries; and then calculates input-output relationships based on the indirect allocation of imports by the ABS methodology.

To measure the strength of the supply chain within a region, however, the indirect allocation tables have to be converted to tables based on the direct allocation of imports into the LGA (Step 4). These tables show the inter-relationships between industries operating within each LGA boundary.

Such tables are estimated from:

(i) the LGA indirect import allocation tables (technological tables); and

(ii) the national direct import allocation tables (as described above).

Once all the steps are undertaken the following scenario can be analysed. A specific example using the meat industry will be considered. Suppose for a region it is found for the meat industry that the column sum is 1.41. This means that for each $1 million of demand for the meat industry in an LGA that $0.41 million of additional output is generated by other industries in the LGA.

The increase in the output of other industries will represent the supply from the:

- agriculture;
- business services;
- energy;
- transport; and
- other manufacturing industries,

into the next industry to enable the meat industry to function. The more the meat industry sources its supplies of goods and services from outside the region, the smaller will be the 1.41 column sum. This figure is refereed to as a Type I multiplier.

NIEIR has two different I/O modules. The first is Current Industry Structure analysis and the second is Specific Project Analysis.

Current Industry Structure *Analysis* is a simple demand shock model. It corresponds to an increase in final demand. That is, an increase in demand for an industry's output. If the region does not have production in that industry the benefit to the region will be minimal as the increase in demand will be sourced from production outside the region.

Specific Project Analysis allows the user to analyse the effects of a new industry or project to the region. The new industry is assumed to expand the level of demand by the full increase modelled (it is assumed that the market for the produced good already exists). This models an increase in final demand.

This module also allows more parameters to be defined, hence increasing the relevance of the analysis. Variables that can be inputted for a specific project include number of employees, annual wage bills, profits and profits retailed locally. These extra options, which are not available using the Current Industry Structure analysis module, increase the accuracy of the estimated impacts on the regional economy.

Using Input-Output in Analysis – Examples

The input-output multipliers provide a way of answering some of the questions often asked by economists and managers. These queries tend to arise because of the types of 'what if?' analysis for which input-output tables can be used (for example, what would be the impact on employment of an x per cent change in output by the chemicals manufacturing industry). This type of analysis is dependent on a knowledge of input-output multipliers and their shortcomings. Using input-output tables, multipliers can be calculated to provide a simple means of working out the flow-on effects of a change in output in an industry on one or more of imports, income, employment or output in individual industries or in total. The multipliers can show just the 'first-round' effects, or the aggregated effects once all secondary effects have flowed through the system.

The basic role of input-output analysis is to analyse the link between final demand and industrial output levels. The inverse table, total requirements coefficient in the national accounts context, could be used to assess the effects on the productive system of a given level of final demand. Employment implications are equally important in this respect. Input-output tables can also be used for analysing changes in prices stemming from changes in costs or from changes in taxes or subsidies.

Here are some practical examples to help illustrate the application of input-output tables. For instance, it is possible to estimate the levels of output of the production sectors required by a given final demand. The effect on other industries of an additional final output of $100 million of the rubber and plastics industry, or a 30 per cent change in exports of steel can be calculated by assuming that average and marginal utilisation rates are the same.

Another example of input-output application is assessing the benefits of a specific project to a regional economy. The analysis of the impact must be broken up into two stages. Firstly the construction phase and secondly the operational phase. Irrespective of which type of industry the project is in, both phases will utilise different input requirements and need to be analysed separately.

For example, the construction of a new motor vehicle plant will require inputs from industries such as; construction, building services, steel and machinery and equipment. The impact of the construction of a $150 million automobile plant on the economy may be $105 million once the direct and indirect benefits have flowed through the economy. That is, regional suppliers have provided this amount of inputs.

Once the plant is up and running it will be drawing on inputs from a diverse range of industries including; rubber and plastics, transport equipment, non-metallic minerals (glass etc.) and the fabricated metals industry. An estimated annual output of $100 million for the plant, may have additional benefit to the regional economy of $75 million. That is, $25 million will be imported intermediate or primary inputs.

The total benefit to the region in the first year will equal $180 million (combining construction and operation impacts).

The results of user analyses will be correct to the extent to which input-output coefficients are stable. This depends on if the assumptions underlying the input-output estimates have been satisfied. One of the main assumption is homogeneity. It postulates that:

1. each sector produces a single output (i.e. all the products of the sector are perfect substitutes for one another or are produced in fixed proportions); and
2. there is no substitution between the products of different sectors.

The homogeneity assumption may be weakened by changes in the product mix (and consequent changes in inputs), the introduction of new products or materials and the substitution of imported products for domestic production. This assumption may be realistic for the year the data is collected but becomes progressively less so as time goes on. National Economics has accounted for the short falls due to the homogeneity assumption by allowing for some of these changes. Estimates of input changes brought about by technological advances have been accounted for using the latest international data and expert advice. Also changes from import substitution have been accounted for by using the indirect import allocation method and analysing trends in trade data.

The second main assumption is the proportionality assumption. It postulates that the changes in the output of an industry will lead to proportional changes in quantities of its input (i.e. for each output, each of these inputs will be a fixed proportion of the total). Economies of scale are therefore ignored. This effect could be accounted for by further refinement of the tables. Given however, that the tables (in quadrant 1 and 3 in our diagram above) represent production functions for firms large and small, any distortions created by the proportionality assumption are balanced out and do not overly bias their use in regional analysis.

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Household Dimension	Selected LGA ($)		All LGAs in SD of selected LGA ($)		All LGAs in State of selected LGA ($)		All LGAs in Aust. ($)	
Household growth	50	☐	55	☐	75	☐	100	☐
Prosperity potential	30	☐	35	☐	45	☐	60	☐
Socio-economic dynamism	30	☐	35	☐	45	☐	60	☐
Population growth	50	☐	55	☐	75	☐	100	☐
Income earning age profile	50	☐	55	☐	75	☐	100	☐
Aged services	50	☐	55	☐	75	☐	100	☐
Job readiness	100	☐	110	☐	155	☐	200	☐
Resident jobs from national growth	50	☐	55	☐	75	☐	100	☐
Wealth	50	☐	55	☐	75	☐	100	☐
Resilience to interest rises and income falls	75	☐	85	☐	115	☐	150	☐
Debt affordability	50	☐	55	☐	75	☐	100	☐
Labour utilisation	100	☐	110	☐	155	☐	200	☐
Progression to full employment	50	☐	55	☐	75	☐	100	☐
Industry Dimension								
Local employment provision	50	☐	55	☐	75	☐	100	☐
Industry growth	75	☐	85	☐	115	☐	150	☐
Output per capita	50	☐	55	☐	75	☐	100	☐
Retained retail spending	100	☐	110	☐	155	☐	200	☐
Knowledge driven growth potential	50	☐	55	☐	75	☐	100	☐
Global knowledge flows	50	☐	55	☐	75	☐	100	☐
Industry structure for future growth	50	☐	55	☐	75	☐	100	☐
Structural employment dynamism	50	☐	55	☐	75	☐	100	☐
Industry jobs from national growth	50	☐	55	☐	75	☐	100	☐
Regional Foundation Dimension								
Community welfare	50	☐	55	☐	75	☐	100	☐
Lifelong learning	50	☐	55	☐	75	☐	100	☐
Lifestyle choice	50	☐	55	☐	75	☐	100	☐
Infrastructure	100	☐	110	☐	155	☐	200	☐
Low skilled and clerical	60	☐	65	☐	90	☐	120	☐
High skilled residents	60	☐	65	☐	90	☐	120	☐
Additional Data								
GRP	400	☐	650	☐	1200	☐	2,000	☐
Cluster Analysis	165	☐	220	☐	275	☐	330	☐
SpendInfo 50	275	☐	495	☐	605	☐	1,430	☐
Demographic profile	165	☐	330	☐	495	☐	660	☐
Social Security Profiling	550	☐	715	☐	1,320	☐	1,980	☐
Closest 10 (all indicators)	495	☐	605	☐	825	☐	935	☐
Output / Value Added 3 digit	**Available only with the complete version of YourPlace**							
5 towns (ratings + Social Sec)	660	☐	990	☐	1,430	☐	2,200	☐
YourPlace-IO (bundled)	2,200	☐						
SOR Profiles 2001	220	☐	330	☐	440	☐	770	☐
SOR Profiles 2002 (including Creativity)	330	☐	440	☐	880	☐	1,650	☐
SOR Profiles 2003	330	☐	440	☐	880	☐	1,650	☐
LGA Profile	Price on request							
Total value	**5,220**		**7,015**		**10,820**		**16,865**	
Bundled price with all components	**4,400**		**5,500**		**6,600**		**7,700**	
Bundled All inc YP-IO (single LGA)	**6,050**		**7,150**		**8,250**		**9,350**	
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the place to go for the performance of Australia's local economies

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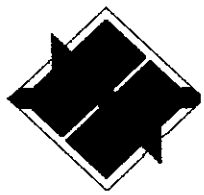

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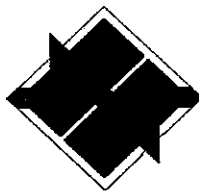

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