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A regional economic performance matrix – an aid to regional economic policy development

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Abstract

This paper presents a model for regional policy makers as an aid to developing policy for regional economic development. The approach to developing the model follows strategic management principles whereby planning is based on setting objectives in the light of environmental scanning for factors that are relevant to development. The model also addresses some of the concerns associated with regional policy planning, namely whether the approach should be driven from the top-down or the bottom-up. Given the regional context, the model positions towns in terms of how well their employment creation corresponds to regional benchmarks. The model therefore provides policy direction for regional town planning. The Richmond-Tweed region is used as a practical example.

Strategic planning for regional economic development – a portfolio approach for regional industry planners

Introduction

This paper proposes a model for supporting the design of policy in regional Australia. The approach to developing the model follows modern strategic management principles whereby planning is based on setting objectives in the light of environmental scanning for factors that are relevant to economic development. The model also attempts to address, in part at least, one of the more debated topics in development planning, namely the veracity of top-down versus bottom-up policy design.

Accordingly, the model is designed to help with setting priorities rather than providing explicit step-by-step pathways to economic development, reflecting the real world context of unfolding action plans that are influenced by the behaviour of numerous stakeholders. The model proposed here attempts to identify forces relevant to employment creation and provide strategic support to goal setting for regional economic development.

This paper starts building the model by reference, in broad detail, to what regional economic development policy means.

Regional economic development policy

Defining economic development can be problematic. In the 1940s, economic development was broadly defined in terms of national goals of maximising output GDP (Arndt 1987). Rising GDP was seen as correlating with poverty reduction assuming 'trickle-down' and progressive income distribution. The limited success of many multilateral poverty reduction programs through the late-middle decades of the twentieth century forced a rethink on what

economic development means (Preston 1982). Over time, economic development has been redefined to recognise the extant human condition - a reorientation towards human development (Streeton 1994). This type of thinking is reflected in the 'Human Development Index' which measures peoples in terms of their relative income, education and longevity, as proxies for human quality of life in terms of capacity and choice (UNDP 1990).

Economic development and *regional economic development*, naturally enough, are related concepts. In this paper, which is about Australian regions, the regional adjective differentiates national from sub-national economic performance. There are various geographic definitions as to what constitutes a region in Australia, but perhaps the most useful is that by the Australian Bureau of Statistics. Australian regions are called Statistical Divisions (SDs) that cover, in aggregate, the whole of Australia without gap or overlap and are 'characterised by identifiable social and economic links between the inhabitants and between economic units within the region, under the unifying influence of one or more major towns' (Castles, 1993, p155).

In economic policy terms, regions are somewhere between the macro and the micro. Regions are bigger than households and industries, but obviously less than provinces and the nation. So there is no clear guidance as to where regional economic policy should be arising. Indeed, a brief historical survey of regional development theory and policy suggests a tendency to take from both macroeconomics and microeconomics.

Stillwell (1992), for example, described the regional economy by the macroeconomic model, $Y = C + I + G + (X - M)$; that is, gross regional product is equal to the expenditures on consumption, investment, government and net exports. Regional policy would then be defined broadly within the macroeconomic domain of fiscal policy. Fiscal policy and regional policy also go together in a political sense because of the opportunities for pork barrelling (Cockfield and Prasser 2005). Fiscal injections can be targeted of course, at infrastructure development for example, but are also undeniably top-down approaches to development.

One related policy front targeting regional adjustment is inspired by Perroux's (1955, 1950) *growth pole* theory, a top down strategy of relocating industry in order to propel economic development of a region. The strategy proposes that importing a lead industry fosters industrial clusters and linkages with local firms, and promotes technology transfer, competitiveness and specialisation. In the past, results have sometimes been disappointing, because of the disruption to local labour and capital markets (Bull, Pitt and Szarka 1991). The relocating enterprises increased the competition for local labour, with consequent wage hikes and movement out of local businesses (Graziani 1979). Large immigrant enterprises also disturb the entrepreneurial processes by reducing the gap between the entrepreneurial wage and labour wage, reducing the start-up on new enterprises (Grossman 1984). Again, immigrant enterprises produce for the local market and drive local smaller enterprises out of the market (Johnson and Cathcart 1979).

Another problem with growth pole policy is the way public infrastructure can accrue to the immigrant (Del Monte and De Luzenberger 1989). Regions can become locked into industry by investment in infrastructure, plant, and education and training facilities. This biases 'the industrial structure of some regions towards certain activities' (BIE 1994 p54), locking them into particular product markets for the long haul. Regions become vulnerable when they are focused on a predetermined industrial core and it is the capacity for diversification that is the key variable in regional performance.

Industry structures may take decades to change (Aldrich 1990). Botkin's (1988) case study described how the business population of Route 128 (Massachusetts) changed over 300 years from an ice economy, through whaling, then textiles, to 'high tech', making the observation that while business populations rose and fell, the financial institutions, business services and universities prevailed. Logically, the emergence of high-technology firms on Route 128 was linked to the renowned research/educational institutions of Harvard and MIT. There was also a big role for government in this process. The Cold War and defence spending on research was a key ingredient (Saxenian 1994). In a sense, the response at the microeconomic level, from the bottom-up, inspired ongoing regional success.

Schumpeter (1934) had notions about microeconomics and the role of the entrepreneur and small enterprise in economic development. Globally, evidence presents a convincing case that small enterprise is the main job generator in the economy, so small enterprise promotion is seen as a fundamental microeconomic policy to foster regional growth (OECD 2004). Small enterprises are assumed to be flexible by nature. They can rapidly establish networks of inter-personal/inter-business relationships, generating marketing and production externalities. As a consequence, these networks of localised and integrated industrial systems are able to manifest a high level of entrepreneurship and new business formation, a high division of labour between firms, high levels of collaboration yet intense competition, and the rapid spread of innovation and socio-economic cohesion (OECD 1990). In essence, small enterprises become the vehicle for diversification out of tired old industry ... a bottom-up approach to regional economic development. Moreover, policy promoting small enterprise development has been useful, even in the most complicated of environments. Micro-credit and small business incubators are examples (McKernan 2002).

Questions will always remain as to the veracity of small enterprise in development (Davis, Haltiwanger and Schuh 1996). Studies show that small businesses are more likely to fail than survive and grow (Watson and Everett 1995). Indeed, small businesses are also the major player in job destruction, in the sense that more jobs are lost in small businesses than in large (Borland and Home 1994).

There has also been theory around the idea of promoting 'industrial districts' as a path to regional successes, following examples in Europe and the US (Amin and Robins 1990). In that case, it is probably true that it is not the amount of small enterprise in the regional economy that promotes development, but rather the flexible and adaptable nature of the boundaries between the firms and their interrelationships (Saxenian 1994). In more recent management jargon, it would be called the capacity to form effective supply chains (Stock, Greis, and Kasarda 2000).

Regions are successful when their industrial structures facilitate the move into new product and new product life cycles (Porter 1990). The business environment is conducive to new ideas and new entrants. These adjusting industrial structures generate a 'self perpetuating momentum' as the effects are multiplied by new firms and people moving to the region to access expanding opportunities (Ullman 1964).

The policy question is how to create such an environment. On the one hand, entrepreneurial activity is by definition decentralised and such free market activity evolves from the bottom-up (Kopetchny 2006). Government can't regulate it into existence, because there is insufficient feedback to design appropriate top-down behavioural proscriptions. The need is for policy that facilitates the expression of aspirations and behaviours from the bottom-up.

On the other hand, government can identify growth industries relatively easily from statistics. Moreover, the role of government is to develop infrastructures and provide other resources to facilitate industrial development because of the inevitability of market failure. Industrial development priorities are required from the top-down.

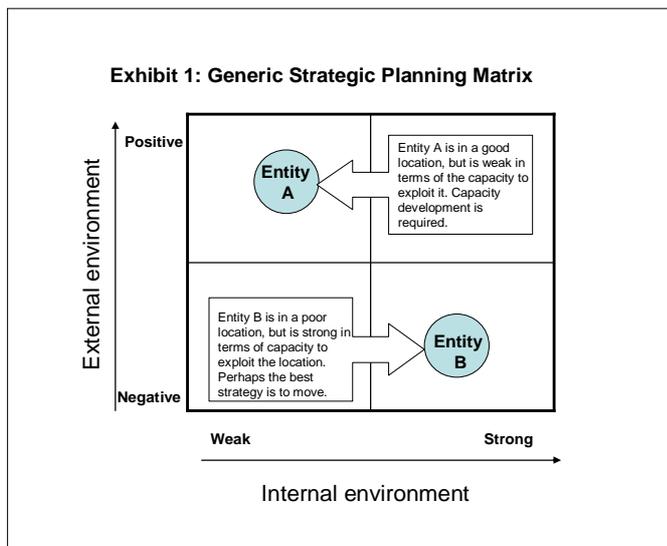
The notion here is that a potential mix of top-down and bottom-up policy instruments are required in the context of industry or economic development (Ryan 1996). The question then becomes: when is bottom-up facilitation as opposed to top-down intervention required? The obvious place to start is with an analysis of economic conditions in terms of existing industrial activity in the regional economy, as well as how well job creation functions in the region.

Strategic positioning in a regional economy

A variety of tools are available from the strategic management literature to help with planning. One popular tool is the environmental matrix or portfolio approach, famously popularised in the Boston Consulting Group (BCG) matrix (Hedley 1977), and often used since in modified form for a variety of purposes, ranging from strategic product planning as per the McKinsey/General Electric Business Matrix (Hofer and Schendel 1978) to international market analysis (Harrell and Kiefer 1993) to small business policy planning (Howard and Hine 2000).

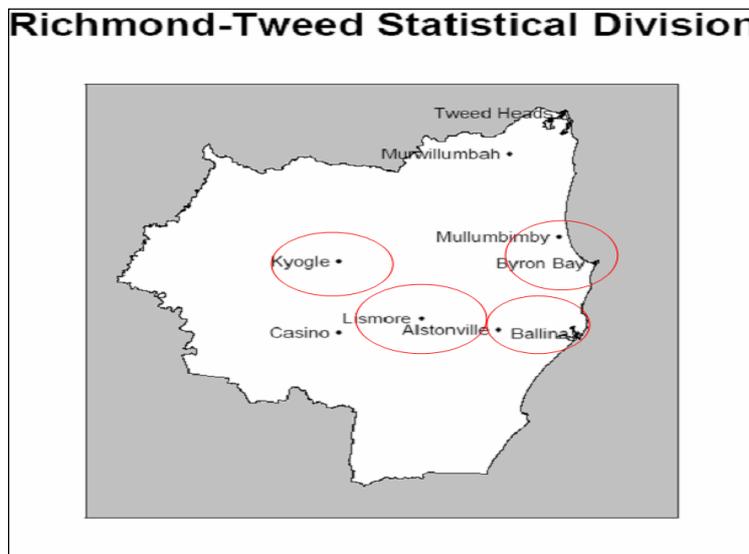
Essentially, the matrix approach can be seen as a method of sorting strategic variables according to two dimensions, the *external environment* and the *internal environment*. The external environment is outside an entity that is being analysed, and it is measured in terms of positives/negatives, such as opportunities present in a location or industry. The internal environment is inside the entity, and it is measured in terms of strengths and weaknesses. These environments position the entity, whether that be in terms of products, projects, or profit centres. A strategic profile is thus presented in terms of potential and competitiveness, and it is possible to compare and contrast different entities in the light of their position in the environments (for example, in a growing or declining market), and make decisions about the future (for example, modify or expand a product line).

The matrix process is also graphical, based on plotting entities in the two dimensions representing the twin environments. Relevant variables are described for each environment and a simple linear scale is developed by adding the variables that have been weighted to reflect their relative importance. Thus, a business organisation might plot its product range in the context of an assessment of the market overall (growth, for example), and its strength in that marketplace (brand awareness). Apart from providing a conceptually simple 'picture' of the strategic position, the matrix also provides clues as to future strategic direction. Exhibit 1 illustrates:



Obviously, if the context is regional development, then the matrix describes the region. By the ABS definition of region discussed above, the units for analysis are the bigger towns which make up the region. Exhibit 2 illustrates with respect to the Richmond-Tweed region of northern NSW.

Exhibit 2:



The dimensions of the matrix.

Thinking about towns as the relevant entity for analysis, in a broader sense, it is mostly the aggregation of township performance that provides the regional performance outcome in terms of job creation. Some towns will perform better than others over time. Logically, this will depend upon two main dimensions. Firstly, job creation will depend upon the industry

mix¹ of the town, that is, of high growth versus low growth industries. To put this in simple terminology, the capacity for job creation is influenced by the 'quality of industry' in the town.

Second, job creation will depend upon the capacity of firms and labour in the town, independent of the industry or region that they are in, to create and fill vacancies. This is the issue of 'job rationing' and 'matching' in labour markets. Again, to put this in simple terms, the notion is that the capacity for job creation will be influenced by the 'employment efficiency' of the town's labour market.

A measure of industry quality – an Industry Quality Index

Industry growth is taken in this paper to be measured by job growth given the regional development context (although other measures would be useful, such as number of businesses or revenues). A region's growth path will be affected by its industry mix. A high proportion of fast growing industry will obviously generate jobs at a rate faster than slow growing industry. Towns within the region, assuming a level of regional homogeneity (as per the definition of region above), will share the broad characteristics of the regional industry mix. Ideally then, a measure of each town's success is how well its industry mix matches the region's mix in terms of fast growing industries.

The notion here is that the percentage of a town's employment that is in the region's fastest growing industries will indicate how well matched the town is to its potential. There is a problem of course in deciding what is meant by 'fastest growing'. Classifying industries is not a problem and the Australia and New Zealand Standard Industry Classification (ANZSIC) system of seventeen industry groups is used here. Employment data is also available from the Australian Bureau of Statistics.

Rates of growth will vary depending upon the time frame. A sensible time frame would be one that reflects an underlying trend rather than temporary or sporadic conditions. The size of the industry is also relevant; a small/new industry may be doubling or trebling in size yet be adding, in absolute terms, relatively few jobs. There is also the potential issue of survival over a reasonable time period; new industries may be susceptible to high death rates.

On that basis, a reasonable time period is assumed to be five years in this paper; five years is often arbitrarily taken as the long run in strategic planning. Other writers have used different time periods; Josef Brüder (1998), for example used four years as a definition of 'surviving' business. But five years also fits with available secondary data, in particular, ABS census data.

Defining 'fastest growing' is also problematic in terms of deciding on how many fast growing industries should be included. Elsewhere, McKinsey and Company (1994) when analysing industry mix in the Australian regional context noted that core industry (normally one or two industries) contribute between 15 percent and 20 percent to regional employment. Howard (2003), in a sample of regions in non-metropolitan Australia, found that generally, and over 25 years of census data, around 50 percent of regional employment is generated by the five biggest industries. One simple approach would then be to obtain a comparative measure between the town and the region based on the percentage of employment in five (or so) of the fastest growing industries. But such a measure would exclude impacts from the other

¹ Industry mix is defined by the proportion of employment that is accounted for by each industry in the location.

twelve industries in the case of using the seventeen ANZSIC divisions. A better approach would be weighted to reflect all the industries and in terms of their relative contributions. A hypothetical example is proposed as follows in exhibit 3, which for want of a better term, calculates an Industry Quality Index (IQI) for a hypothetical town.

Exhibit 3: Hypothetical Industry Quality Index for a Town

Industry	% of regional jobs created by the industry	Difference in industry mix (%) between town and region	Jobs effect ²
Agriculture	20	-5	-100
Manufacturing	30	0	0
Services	50	5	250
Total	Sums to 100%	Sums to zero	150
Industry Quality Index (IQI) = 150/1200 = .125			

Exhibit 3 illustrates a hypothetical analysis for a town compared to its region assuming three industries. The lead industry in the region in terms of job creation is services, while agriculture is the lesser performer according to the second column. In the third column, the town's industry mix is being compared to the region. The town being analysed has 5 percent more of its employment in services than the regional benchmark. This is a good thing because the services industry is the better job creator in the region. The town also has less of its industry involved in the relatively poorer performing agriculture, by 5 percent in fact. So, with its given industry mix, if the town matches the regional average job creation per industry, then the net effect of the industry mix, is a potential +150 jobs.

Overall, the town has a good score. The town loses jobs in agriculture, but adds even more because of its services orientation. Indeed, in the table's example, for every job lost in agriculture, two and a half are gained in services. The IQI itself is calculated by dividing the actual net jobs effect by the maximum possible jobs effect, that is, if the town's entire industry was in the fastest growing industry.

A measure a labour market dynamics – an Employment Efficiency Index (EEI)

The Employment Efficiency Index (EEI), and again for want of a better term, measures the capacity of the town to create jobs independent of the industry mix. A useful way of measuring this performance is via shift share analysis (Bishop and Simpson, 1972), which

² For the mathematical formula, refer to Howard and Harrison (2006).

decomposes job creation into its constituent parts³. When measuring job growth in a nation, for example, shift share allocates new jobs to three sources, namely:

- the macroeconomy,
- the regional industrial mix, and
- a residual that reflects independent job creation, a sort of regional dynamism.

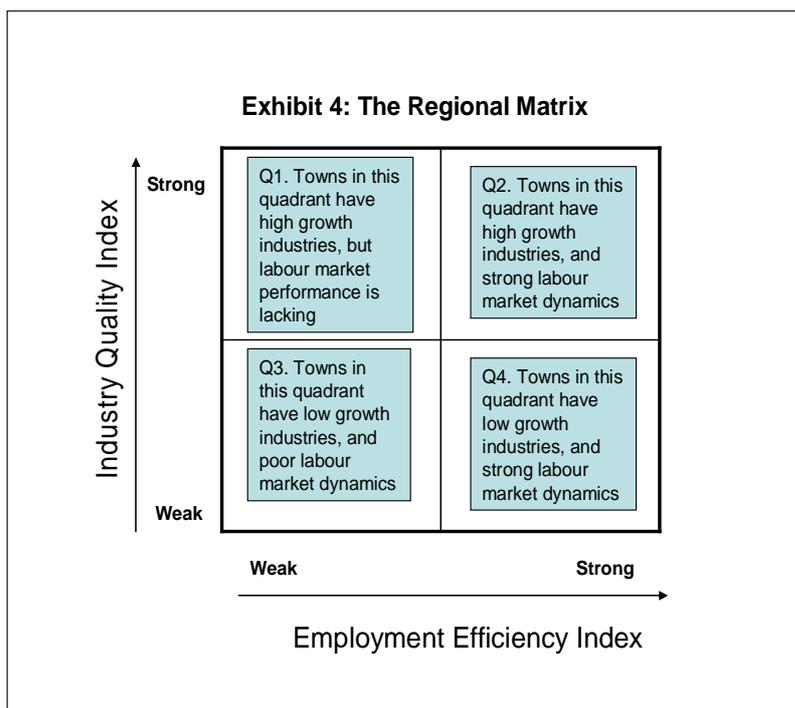
In the case of a regional town, shift share analysis can calculate the number of jobs attributable to regional economic growth and to the industrial mix of the town. So, the strength of the regional economy will influence town job growth, as will the town's mix of industries, whether they be fast growing or slow growing. The balance or residual, between actual job growth and job growth attributable to the region and the town's industry mix, is an indicator of the town's dynamic employment generation capacity. A positive residual suggests that the town is more efficient at creating jobs than the industrial structure dictates. The calculation of the EEI is taken as the percentage the residual contributes to employment in the town.

Using the matrix as a tool for policy planning

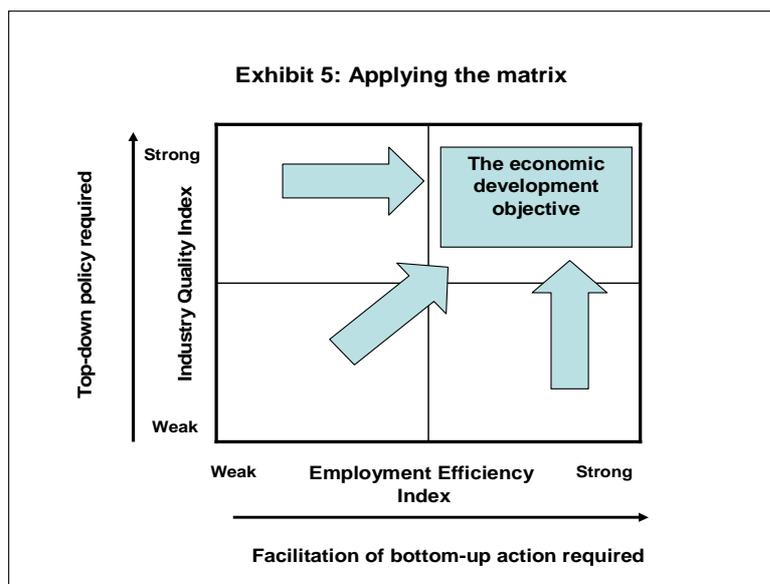
A simple matrix model can therefore be proposed which summarises the external and internal environments. In exhibit 4, the internal environment of the town is represented by the horizontal axis and it ranges from strong to weak, in describing how well employment is created in the town independent of the regional and industry mix. The quality of industry in terms of job creation potential is captured on the vertical axis and measured in a range from weak to strong.

Four general quadrants are identified. Towns in quadrants 1 and 2 have an industry mix that is strong in terms of job creation prospects. Towns in quadrants 2 and 4 have efficient labour markets in that they generate jobs at a better rate than the regional or industry average.

³ A simple method of conducting shift share analysis that is used in this paper is that by Dinc (2002).



The matrix becomes useful at a strategic level for regional policy design when towns can be plotted against the two axes. The strategic implication is that towns in the left and lower quadrants should be 'pushed' upwards and towards the right, as per exhibit 5.



So a town that is positioned in one of the left quadrants suggests its employment creation potential is less than the potential offered in the region. In general, what is required is a plan

for developing labour market dynamics in the town. Clearly, this is a broad field in itself but the notion is to launch a range of bottom-up initiatives designed to facilitate entrepreneurship and labour market flexibility, and might include:

1. business skills and motivation training including entrepreneurship,
2. provision of business advice and other generic informational resources (eg., business planning for business start-ups),
3. network development for co-operative ventures including strategic alliances and other collaborative structures, and
4. communications development for cross-fertilization in exchange of ideas (Autio and Klofsten 1998).

Policy would then be directed at resourcing relevant community organisations such as chambers of commerce, training and advisory centres, development organisations and perhaps, community service organisations.

Towns that are located in the lower quadrants of the matrix have their employment located in low growth industry relative to regional benchmarks. The obvious strategy is to shift the orientation towards an industry mix with better prospects. Having identified where the town should move its industrial focus, the need for specific top-down initiatives arises. Again, the policy options are extensive, but might include:

1. appointment of experts and industry development offices specific to industries,
2. tied grants and subsidies,
3. industry- or enterprise-specific training programs, and
4. development of dedicated infrastructure.

Applying the theory – a regional case study

The four towns (Statistical Local Areas) from the Richmond–Tweed region chosen for analysis are Kyogle, Lismore, Ballina and Byron Bay (as per exhibit 2). These towns were chosen because they are somewhat different from each other in an industrial sense. Lismore is the home to Southern Cross University and the major hospital in the region, namely Lismore Base Hospital. Kyogle is a smaller rural town, with a traditional industrial scene based around agriculture. Ballina is a beachside community, but also functions somewhat as a dormitory/retirement suburb for Lismore. Byron Bay is an internationally famous 'alternate lifestyle' beachside resort that attracts tourists world-wide (NSW GenWeb 2007). So, expectations are that their industries and labour markets could present quite different scenarios. Calculations of the index values for the towns, as proposed above, can be done using ABS data. (2006 census data was not available at time of writing.)

Job growth rates in the different industries in the Richmond-Tweed region are given in exhibit 6, ranked from the fastest growing to those in decline. Services are clearly the fastest growing in the time period, while agriculture and manufacturing are in decline. (Note that the industries are ranked by growth rate, not number of jobs created by the industry. That data is contained in exhibit 7.)

Exhibit 6: Industry Growth Rates			
Richmond-Tweed SD	Jobs in 2001	Jobs in 1996	Approx. Job Growth Rate
Cultural and Recreational Services	1,707	1,370	25%
Property and Business Services	5,994	4,885	23%
Retail Trade	13,094	11,228	17%
Government Administration and Defence	2,683	2,372	13%
Education	6,362	5,635	13%
Health and Community Services	8,924	7,923	13%
Accommodation, Cafes and Restaurants	5,380	4,920	9%
Personal and Other Services	2,642	2,449	8%
Transport and Storage	2,405	2,231	8%
Wholesale Trade	3,256	3,027	8%
Construction	5,411	5,044	7%
Manufacturing	6,301	6,637	-5%
Agriculture, Forestry and Fishing	5,552	5,955	-7%
Finance and Insurance	1,535	1,647	-7%
Not stated	1,361	1,547	-12%
Communication Services	995	1,159	-14%
Electricity, Gas and Water Supply	349	428	-18%
Non-classifiable economic units	432	629	-31%
Mining	108	189	-43%
Total	74,491	69,275	8%

Exhibit 7 contains statistics for Lismore. It describes the difference between the industry mix in Lismore compared to the region, and given this difference, the consequences in terms of jobs added/lost according to the regional average. For example, Lismore has 37 percent of its employment in retail, a percentage point above the regional average. This adds a potential 27 jobs. The table also calculates an IQI. The summary overall is that Lismore's industry mix is

strong in terms of job creation potential, although there are prospects for improvement in terms of shifting industry towards Accommodation, Property and Construction..

Exhibit 7: Industry Mix Effects on Job Creation Potential - LISMORE			
	percent of regional jobs created by the industry	Difference in industry mix between town and region	Jobs effect
Retail Trade	36	1	27
Property and Business Services	21	0	-9
Health and Community Services	19	3	52
Education	14	2	27
Accommodation, Cafes and Restaurants	9	-3	-22
Construction	7	-2	-12
Cultural and Recreational Services	6	0	-3
Government Administration and Defence	6	0	-1
Wholesale Trade	4	0	1
Personal and Other Services	4	0	0
Transport and Storage	3	-1	-2
Electricity, Gas and Water Supply	-2	0	0
Mining	-2	0	0
Finance and Insurance	-2	0	-1
Communication Services	-3	0	-1
Not stated	-4	0	1
Non-classifiable economic units	-4	0	1
Manufacturing	-6	0	-1
Agriculture, Forestry and Fishing	-8	0	0
Total	100	0	57
Industry Quality Index = 57/910 = 0.062637			

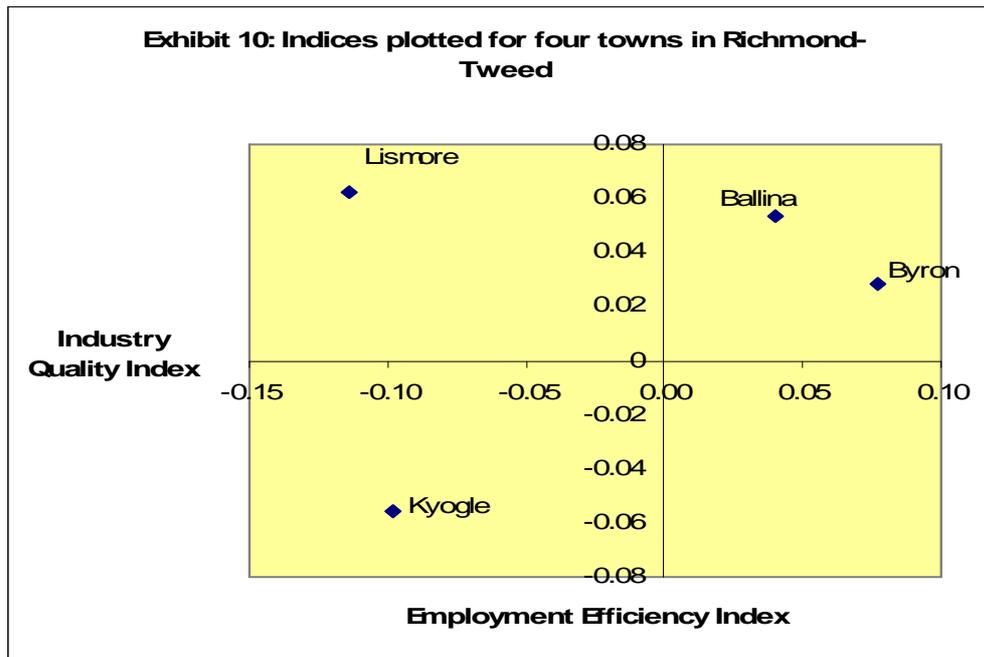
Exhibit 8 provides statistics for Byron. It separates the jobs added between 1996 and 2001 into three categories; those added by region-wide effects, by industry, and a residual which is job creation independent of region and industry. In other words, 833 jobs were added to Byron's employment numbers, independent of regional growth and industry mix. The EEI at 0.077406 (equal to 7.7 percent of the workforce) is a strong result.

	Jobs in 2001	Jobs 1996	Jobs belonging to		
			Region	Industry	Residual
Agriculture, Forestry and Fishing	596	697	52	-100	-54
Mining	9	44	3	-22	-16
Manufacturing	875	800	60	-101	116
Electricity, Gas and Water Supply	47	69	5	-18	-9
Construction	800	659	50	-2	93

Wholesale Trade	449	367	28	0	54
Retail Trade	1,788	1,470	111	134	74
Accommodation, Cafes and Restaurants	1,174	932	70	17	155
Transport and Storage	327	254	19	1	53
Communication Services	109	101	8	-22	22
Finance and Insurance	195	193	15	-28	15
Property and Business Services	982	733	55	111	83
Government Administration and Defence	310	321	24	18	-53
Education	953	777	59	42	76
Health and Community Services	1,197	933	70	48	146
Cultural and Recreational Services	332	227	17	39	49
Personal and Other Services	359	307	23	1	28
Non-classifiable economic units	62	107	8	-42	-11
Not stated	203	215	16	-42	14
Totals	10767	9206	693	34	833
Employment Efficiency Index = 833 / 10,767 = 0.077406					

In exhibit 9, the index measures for the four towns are presented. In exhibit 10, the measures are plotted according to the matrix dimensions of IQI and EEI.

Exhibit 9: Index Measures		
SLA	Employment Efficiency Index	Industry Quality Index
Byron	0.077	0.0285
Lismore	-0.114	0.0626
Kyogle	-0.098	-0.056
Ballina	0.0398	0.0538



The broad proposition put above was that the towns were different in an industrial sense. The matrix reflects this, with each town assuming significantly different positions in the matrix.

Moreover, *a priori* expectations would seem to be confirmed. Kyogle with its traditional industrial base is well down the IQI compared to Lismore with its more 'contemporary' industries. Meanwhile, Byron's aggressive and 'out there' image is confirmed with the highest EEI score.

Conclusion

The matrix may therefore be recommended as a tool to aid strategic analysis and design of regional policy. It is, in essence, a model which contains information that is relevant to regional development and yet is conceptually simple in terms of describing the strategic position of towns and in terms of broader regional benchmarks. The matrix can go further to suggest the broad direction that policy can take, whether top-down or bottom-up.

The matrix also enables the addition of specifics to the policy. Calculating the IQI enables the policy analyst to see where the industry mix is 'going wrong', and which industry needs promotion. In the exhibits above, the evidence is that Lismore's IQI is high yet there are some weaknesses in industries such as accommodation and construction. The EEI also enables the analyst to determine which industries are lacking labour market dynamics in terms of regional benchmarks.

The calculations presented contain data from the 1996-2001 census data period. Data could also be taken from previous census periods, and soon, to incorporate 2006 data. In that sense the IQI and EEI will provide evidence as to how the town economies have evolved over time. The model can also be readily adapted to other regions in Australia and elsewhere.

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