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Forecasting employment demand: a comparison of employers’ perceptions and historical data in a regional LGA

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Abstract

In managing local economies and developing plans for local government areas managers need to have an understanding of employment demand and business’ plans for expansion. In this paper the results of a study are presented based on an investigation into small business owners’ perceptions of employee demand and compared to previous employment levels and intentions to expand their premises or land. The findings suggest caution should be taken when interpreting business operators’ reported intentions to increase employment and that intention to expand buildings and/or land may be an alternative measure of business and employee expansion plans. Implications for planning and policy are discussed.

Introduction

Employment drives substantial components of a regional economy and its growth is of importance to local government and businesses alike (Armstrong and Taylor 2000). An aging population and, in Australia in recent times, a vibrant and booming economy means it is important for local government to understand developments occurring in employment demand.

Historically, labour market statistics have been used as a measure of employment levels and used to project future employment. An alternative to examining such data is to measure employer’s future employee demand. This can be done through judgment methods, where the respondents’ perceptions or projection of future employment behaviour are used as an indicator of demand.

There are a number of forecasting methods that can be applied to the problem, the most common approaches include time series analysis, econometric methods and judgment methods (Armstrong 2001). Time series analysis examines employment growth over time based on historical records while econometric methods use statistical analysis, such as regression to develop demand forecasts. The third approach obtains a judgment or opinion from an informed source, such as employers’ perceptions about whether they intend to employ more staff, or alternatively to expand their premises. The media regularly report the
results of judgments about employment and business conditions based on surveys such as the ‘Small Business Survey’ (StGeorge ACCI 2007).

While the process of investigating time series or regression models is generally well understood and practiced by economists, when little prior historical information is available surveys of employers are often used by consultants as a guide to gain an idea of “intention” to employ or not employ. However little is known about the relationship between employers perceived intent and prior historical employment behaviour. From a historical perspective if an employer has been expanding employment due to positive economic growth then their expectations for future employment growth would also be for future employment growth. On the other hand, an employer who did not have a history of employment growth would be expected to forecast constant employment, i.e. the same level of employment rather than employment growth.

Employment has been a measure of small business growth along with sales and turnover (Kelley and Nakosteen 2005) while other measures have included growth in assets, market share, physical output and measures of profitability (Dobbs and Hamilton 2007). These later measures cover inputs as opposed to employment, sales and turnover which are outputs. It has been argued that researchers should measure both inputs and outputs when evaluating the growth of small businesses (Watson 2002). The expansion of land or premises is one input measure of potential growth as it reflects an owners current circumstances. A business that is crowded for space and capacity will need management to consider options for relocation or expansion. These decisions have an impact on planning and land demands of local governments.

This paper presents a case study of the results from a study that collected historic data on employment and compares them to employers’ judgments about intention to expand employment and their premises or land. The paper is organised into four sections. The first provides an overview of the region and presents details of industry activity that has been the basis for employment demand in the past. The second section outlines details of a study conducted in the Local Government Area (LGA) and is followed by a section reporting the results and analysis of the data from the study. The final section discusses the findings and presents policy implications based on the findings.

Overview of the Region

To provide an understanding of the social and economic situation for the region being investigated, demographic, geographic and emerging employment and industry opportunities are provided. These present a picture of a rural area which has been dependent on agriculture but is now experiencing growth across a diverse range of new industries including energy, tourism and transport.

The study was conducted in the Richmond Valley local government area (LGA) in Northern New South Wales, Australia. It is an area of approximately 3,051 km$^2$, stretching some 85 kilometres, from the foothills of the Great Dividing Range to the shores of the Pacific Ocean. The area is traversed by the Pacific and Bruxner Highways, Summerland Way and the main Sydney to Brisbane Rail Line which provides direct access to the expanding Port of Brisbane (Richmond Valley Council 2006). In 2004 the area had a population of 20,900 (Australian Bureau of Statistics 2006) however more recent estimates indicate a growing population now over 22,000. The population has a median age of 41 years.
Traditionally the area has had a strong agricultural background with beef, dairying, sugar cane and timber industries all playing a significant role in economic development. The area also has a large proportion of its area (30%) included in National Parks and State Forests. As a result of the strong reliance on these more traditional industries the area has also, at times, fallen victim to and remains vulnerable to the impacts of changes in these industries. Recent changes have ranged from deregulation and quotas being applied in the dairy industry to climatic events such as storms, frosts and drought, as well as bushfires and flooding, each impacting upon local small business. The two biggest employers within the LGA both base their businesses upon agriculture.

Like many regional areas along the east coast of Australia the effects of the sea/tree-change phenomena (Hamilton and Mail 2003) have started to be felt, as choices are made to relocate away from larger metropolitan centres. In turn, part of the ripple effect from this population shift has been increased demands on not only infrastructure, but the creation of new community needs and wants, in order to maintain a lifestyle that may have been experienced elsewhere. Employment opportunities are one of the demands of these newcomers.

There have been a number of significant developments in the study area over the past five years that are summarised in Table 1. The developments provide an optimistic outlook for the region. Structural industry changes that have had a negative effect on the region have run their course and recent developments and future prospects are seen as compensating for such changes and provide opportunities for the region. To examine whether this sentiment had translated to the local employment community and to develop a greater understanding of the demand for employment, a study of local employers was undertaken by the local economic development office. The study is outlined in the following section.

Table 1: Recent Industry Developments

| **Agricultural Based Industries** |
| Agriculture is the largest regional employer with beef, dairying, sugar cane and timber the main industries. Other agricultural industries in the region include poultry and fishing. Newer/emerging industries include olive growing and production, stone fruit coffee plantations and ti tree oil production. |
| **Co-generation plant** |
| A co-generation plant based on biomass fuels (bagasse and cane leaf) is under construction in the LGA (Fawkner 2001). |
| **Commercial developments** |
| The main commercial centre within the LGA is about to gain a third retail area and the addition of a third national supermarket. This will be the second such development in less than 10 years. Two multinational fast food companies have also expand their operations into the area. |
| **Gas exploration** |
| Quantities of methane gas have been found within the LGA leading to gas use as an alternate fuel source. This methane (coal seam) gas is part of the large NSW Clarence Morton Basin (Broamby 2007). In addition plans are underway to develop a 30mw power station, as well as a pipeline into Southeast Queensland (Sinton 2006). |
| **Health** |
| As with many other rural areas in Australia, local health services have endured budget cuts and restructures, despite increased demand through an ageing population and the sea/tree-change phenomena. There is a shortage of Dentists and General Practitioners, with the local GP population aging. Two local aged care facilities have redevelopment/expansion plans in place. |
Motorhome Village
A 120 hectares that was once used as part of a regional airport facility has been developed into Australia’s first motorhome village (Eustace 2007). The development has increased the transient and permanent population. Ongoing development of this facility includes an aged care facility for members of the Campervan and Motorhome Club of Australia (CMCA). The development provides employment opportunities in tourism, aged care and light industry.

Transportation
The area is linked to metropolitan centres by both rail and road networks which are being upgraded (Australian Rail Track Corporation 2005; Roads and Traffic Authority (NSW) 2007).

The Study

Given the diverse and changing nature of industry and services required in the area an employment business survey was undertaken to provide data for the development of an economic development strategy and to provide the Council, economic development committees and business groups information on employment demand in the LGA.

The employment survey was conducted in two stages with a total of 825 questionnaires mailed to local businesses within the LGA. A total of 99 responses were returned, however after checks for incomplete information only 91 responses were usable, providing an effective response rate of nine percent. While the response rate was low when non-employing business were taken into account the response rate was an acceptable 25.3%. An examination of the respondents indicated coverage from all main employer industry groups known to operate in the region.

The survey collected data on the businesses’ activities along with annual details of full-time and part-time employee numbers over the period 2002 through to projections for the end of the financial year of June 2006. In addition respondents were asked two additional questions which required them to indicate whether the employer intended to employ more employees and/or expand their premises (buildings or land requirements) over the next three years.

Results from the Study

Results from the businesses that had responded indicated substantial employment growth from 2002 to 2006 (see Table 2). This had occurred in the number of both full-time and part-time employees, with higher growth reported in the number of part-time employees. In the 4 years between 2002 and 2006, full-time and part-time employment increased by 36%. Full-time employment growth was 92 jobs or an increase of 28%. Approximately the same number of new part-time jobs were reported and represented growth of 50% over the same period. The growth in part-time employment is in line with national statistics which have reported greater increases in part-time job growth compared to full-time jobs growth (Australian Bureau of Statistics 2007).

Table 2  Summary results of employment and intended employment

<table>
<thead>
<tr>
<th>Description</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample size (n)</td>
<td>91</td>
</tr>
<tr>
<td>1 - Total number of full-time persons employed est. to June 2006</td>
<td>416.5</td>
</tr>
<tr>
<td>Difference in number of full-time jobs between 2002 to 2006</td>
<td>92.5</td>
</tr>
</tbody>
</table>
In relation to future plans for employment growth, 46% of respondents indicated they were considering expanding employment over the next three years. The findings provide support for employment growth to be expected over the short term and are also in line with national figures that have seen the lowest unemployment figures reported in 33 years (Karvelas 2007). Of the respondents 35% indicated they would consider employing an apprentice or a trainee over the next three years while 21% also indicated that they were considering expanding their premises or land. The findings were taken as being positive for the economic future of the LGA and indicated that the recent economic activity, as summarised in Table 1, was being reflected in the future plans of employers.

**Sources of Employment Growth**

By examining the number of employees over the four year period, employment growth arising from new and existing businesses can be calculated. The number of businesses that indicated they had employees in 2002 were labelled as “Established Businesses”. While those who indicated no employees in that year, but listed employees in subsequent years, were categorised as “New Businesses”. A comparison of employment statistics for the two groups is presented in Table 3.

**Table 3 ** Employees attributed to Established and New Businesses

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>2002</th>
<th>2006</th>
<th>Employee Increase</th>
<th>Employee Increase per business</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full-time Established</td>
<td>74</td>
<td>324</td>
<td>363.5</td>
<td>39.5</td>
<td>.53</td>
</tr>
<tr>
<td>Part-time Established</td>
<td>188</td>
<td>236</td>
<td>48</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full-time New</td>
<td>16</td>
<td>53</td>
<td>53</td>
<td>3.31</td>
<td></td>
</tr>
<tr>
<td>Part-time New</td>
<td>46</td>
<td>46</td>
<td>2.88</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
From Table 3 it is evident that the increase in new full-time and part-time employees on a per business basis can be attributed to new businesses rather than to established businesses. Established businesses had an average of .53 additional full-time employees over the period 2002 to 2006. This increased to .65 for part-time employees. In contrast the new businesses had an average of 3.31 additional full-time employees and 2.88 part-time employees over the similar period. The findings indicate that greater employment growth came from the new enterprises rather than from established enterprises.

An analysis of the type of industries represented among the 16 new businesses revealed there were two manufacturers who accounted for the largest proportion of new employees over the time of the study. Retailers accounted for the next highest number of employees.

**Plans for Expansion**

A second question was asked of employers regarding their plans for expansion. A comparison was made between the two business groups and whether the businesses indicated they planned to expand the number of employees and expand their premises. The results are presented in Table 4.

**Table 4  Percentage of new and established businesses’ plans for expansion**

<table>
<thead>
<tr>
<th>Percentage with plans to…</th>
<th>New Businesses (n=16)*</th>
<th>Established Businesses (n=75)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expand Employees</td>
<td>69%</td>
<td>42%</td>
</tr>
<tr>
<td>Employees Same</td>
<td>31%</td>
<td>57%</td>
</tr>
<tr>
<td>Expand Land</td>
<td>38%</td>
<td>17%</td>
</tr>
<tr>
<td>No land expansion</td>
<td>56%</td>
<td>78%</td>
</tr>
</tbody>
</table>

* Percentages do not add to 100% as “Maybe” or “Not Stated” are not included in the calculations

The results from Table 4 indicate that a higher proportion of new businesses indicated they intended to expand their employees (69% vs 42%) and to expand their premises/land (38% vs 17%) in comparison to established businesses.

To further explore business’ planned employment demand the relationship between employment history and stated intention to employ new staff was examined. Logistic binary regression (Lindsey 2004) was used to identify significant relationships between the number of employees for the years 2004 to 2006 with employers intention to employ. Logistic regression was used because the dependent variable was binomially distributed.

The dependent variable “intention to employ more staff” was coded as a binary variable with no intention to employ more staff coded ‘0’ and plans to employ more staff, coded ‘1’. No relationship was found between the number of full-time employees or the average increase in employment over the five year period with intention to employ more staff. A second set of tests based on part-time employment also failed to show significant results. The findings indicate that the intention to employ more staff was not related to previous employment history.

To examine the relationship between the output of employment and an input to the business the relationship between plans to expand premises/land and previous full-time employment was examined. A significant model was identified ($\chi^2_{(df=5)} = 17.97$, $p=.003$). The Hosmer and Lemeshow test also supported the model. The Cox and Snell R square and the Nagelkerke R
square values were .19 and .30 respectively suggesting that between 19 and 30 percent of the variability is explained by the independent variables. Results of the regression values from the model are presented in Table 5. The results reveal only two variables were significant, full-time employment in 2002 and full-time employment in 2006 the most recent and least recent employment figures collected.

Table 5: Regression values from logistic regression

<table>
<thead>
<tr>
<th>Full-time Employment</th>
<th>B</th>
<th>S.E.</th>
<th>Wald</th>
<th>df</th>
<th>Sig.</th>
<th>Exp(B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ftjun02</td>
<td>-1.017</td>
<td>.519</td>
<td>3.844</td>
<td>1</td>
<td>.050</td>
<td>.362</td>
</tr>
<tr>
<td>ftjun03</td>
<td>.280</td>
<td>.763</td>
<td>.135</td>
<td>1</td>
<td>.713</td>
<td>1.324</td>
</tr>
<tr>
<td>ftjun04</td>
<td>.139</td>
<td>.851</td>
<td>.027</td>
<td>1</td>
<td>.870</td>
<td>1.149</td>
</tr>
<tr>
<td>ftjun05</td>
<td>-.539</td>
<td>.802</td>
<td>.451</td>
<td>1</td>
<td>.502</td>
<td>.584</td>
</tr>
<tr>
<td>ftjun06</td>
<td>1.136</td>
<td>.526</td>
<td>4.666</td>
<td>1</td>
<td>.031</td>
<td>3.115</td>
</tr>
<tr>
<td>Constant</td>
<td>-2.051</td>
<td>.482</td>
<td>18.089</td>
<td>1</td>
<td>.000</td>
<td>.129</td>
</tr>
</tbody>
</table>

From Table 5 the results in the Exp(B) column indicate the ‘odds’ of indicating an intention to expand premises or land over the next three years. These are 3.115 times higher for each additional staff member employed in 2006 and decreases by 0.362 for every employee reported in 2002. For this sample the findings indicate that employers with larger numbers of employees were more likely to have expansion plans, and established employers (2002 and prior) were less likely to have expansion plans. An examination of employment numbers by intention to expand indicates those employers who employed more than three staff had greater potential for expansion than employers employing fewer than three staff.

Discussion and Policy Direction

Results reported in this study provided management of the economic development office an indication of employment demand for the LGA. The findings also indicated a growth in the number of employees and that the proportion of full-time to part-time employment reflected a broader employment trend occurring at the national level with higher numbers of part-time employees. In relation to the next three year period respondents indicated intentions to increase employment for general employment, employment of apprentices or trainees and a large proportion had plans to expand their premises/land.

Of importance to economic development managers was the finding that new businesses contributed more employment growth and substantially higher employment growth per business compared to established businesses. The findings support the strategy of policy makers who encourage new businesses into the region and from within the region rather than relying on existing businesses for employment growth (Reese 1994; Dewees et al. 2003). This is despite objections from business owners who argue that it should be existing businesses who are supported for local growth. Whilst urban land release strategies have been developed for the main communities within the study area, it is interesting to note that the
majority of business enquiries for available industrial/employment lands have come from businesses outside of the local area. However it is unclear from this study as to why existing businesses were reluctant to undertake expansion especially at a time when economic conditions were favourable.

Further understanding of employment intentions were found when examining ‘intentions’ and previous employment activity. When responses to the question “do you plan to employ more staff” were compared to previous employment statistics, no relationship was found for the number of full-time or part-time employees. While it was expected that previous employment would be an indicator of future employment plans, the results did not reflect this situation. Instead the ‘intentions’ results appear to be reflecting a more confident future. For policy makers the findings indicate that previous employment statistics do not necessarily provide an appropriate measure of employment demand intentions and vice versa.

Examining differences in employment intentions by the length of time the employer had been in business provided insights into the source of new employment. New businesses had, on average, higher intentions to employ than existing businesses. Further it was found that businesses that employed three or more staff were more likely to indicate intentions to expand or relocate to new premises in the next three years. The findings suggest that newer business to an area have a greater potential for employment growth than traditional businesses. The exact reason for this finding is not apparent from this study although it can be speculated that newer businesses are more aggressive in seeking growth and draw on new ideas, methods and techniques that may not have been adopted by existing businesses (Miller and Friesen 1982; Kreiser et al. 2002). While it is important to attract new businesses to an area it is also important to attract entrepreneurial people to the area and engage them in running existing businesses.

Of relevance to researchers of regional economic development it was confirmed that the input “intention to expand premises or land” was an indicator of historical employment. It is possible a business operator who has expansion plans may have been thinking more deeply about their future plans and beyond employment intentions.

The findings from this study relate to a single LGA located in Northern New South Wales, Australia, therefore caution is recommended in generalising the findings more broadly. The findings will be of assistance to those interested in regional economic development as they provide an insight into the relationship between employers intentions and historical employment data, a relationship that has not be examined previously.

Conclusions

The findings presented in this paper should alert economic development managers to treat with caution estimates of employment based solely on respondents’ judgements. Where possible, when surveying employers, the inclusion of historical data enables the researcher to cross-validate ‘intentions’ and provides insights into the relationships between previous employment and employment intentions. Such analysis can assist in better understanding employment demand.
References

