

JOB VACANCY MONITORING IN NEW ZEALAND AND JOBS ONLINE

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Abstract

Information on job vacancies is important because it provides valuable information about the labour market. Changes in the number of job vacancies (especially occupational breakdowns of the data) is an indicator of change in labour market demand. This knowledge is important for the formulation of immigration and tertiary education policy.

The overall aim of this paper is to raise the awareness of the Department of Labour's new Jobs Online vacancy monitoring programme, as a useful indicator of labour market conditions and dynamic changes in the relationship between unemployment and vacancies.

This paper presents recent advancements in the collection of job vacancy information in New Zealand using Jobs Online.

JEL Codes: **J63** (Turnover; Vacancies; Layoffs), **J64** (Unemployment: Models, Duration, Incidence, and Job Search).

Keyword(s): Vacancies, labour, Beveridge, skills.

Introduction

Information on job vacancies is important because it provides a range of information about the labour market. Job vacancies indicate that employers are willing to commit resources to advertise, interview and pay ongoing wages or salaries to potential employees. Vacancy data also provides information about economic changes resulting in job openings for people to produce goods and services. Furthermore, studies of the matching between vacancies and the unemployed can reveal important information about how the labour market is functioning.

However, we encounter several challenges in the collection of vacancy data. This paper will outline the construction of the Department of Labour's methodology to collect vacancy information, and the issues we encounter in doing so.

In December 2009, the Department of Labour began publishing the *Jobs Online* vacancy monitoring programme (*Jobs Online*) report. *Jobs Online* tracks changes in the number of advertised vacancies by occupation, industry and region, over time, using advertisements listed on SEEK and Trade Me Jobs.

Jobs Online provides valuable data to Department of Labour stakeholders and this is explored below.

The overall aim of this paper is to raise the awareness of the Department of Labour's new *Jobs Online*, useful indicator of labour market conditions.

Relationship between vacancies and unemployment

The relationship between vacancies and unemployment in the overall economy can be summarised by the Beveridge curve. Simply stated, the Beveridge curve

illustrates that a low vacancy rate coincides with high unemployment and high vacancy rates coincide with low unemployment.

The rationale behind the curve is that when the economy is expanding, the demand for labour is high (and job vacancies are high), but most people who are looking for work have already found employment (and unemployment is low). Alternatively, when the economy is slowing or contracting, there is little demand for additional workers and available jobs can be filled quickly so unemployment is high. These effects result in movements along the Beveridge curve.

Silverstone (2005) explains that the above dynamic relationship between vacancies and unemployment can assist policy makers in understanding if there are issues regarding the matching of unemployed people to specific vacancy opportunities. This data can also assist in forecasting unemployment changes.

Reasons for a new vacancy series in New Zealand

Collection of job vacancy information from newspaper advertisements in New Zealand dates back half a century. Table 1 gives an overview of various job vacancy series collected in New Zealand since the 1950's.

The longest running series is the ANZ job advertisements series¹, beginning in 1990 and still collected today. This started as a monthly count of newspaper advertisements. In 2000, this was combined with advertisements from major websites.

¹ The Department of Labour took over producing the ANZ job advertisement series from ANZ bank in March 2007.

From 2002 to 2007, the Job Vacancy Monitoring Programme (JVMP), run by the Department of Labour, addressed the growing demand for labour market information. JVMP collected job vacancy advertisements from all major newspapers in New Zealand. Compared with the ANZ series, the JVMP data was disaggregated by occupation and removed duplicated job advertisements.

There were several contributing factors to the termination of the JVMP. Firstly, collection and processing of the data for the JVMP was a costly manual process.

Secondly, over the three years to 2009 there was a significant growth in the number of jobs advertised online. This shift to online advertising meant a newspaper based series no longer provided an accurate count of job vacancies advertised. Figure 2 shows newspaper advertised jobs steadily decreased between September 2004 and May 2009, while at the same time online job advertisements continued increasing until March 2008.

According to the 2008 Quarterly Management Survey², 96% of recruitment firms use job boards in the hiring process. In November 2009, the most dominant internet job board in New Zealand, SEEK, first published the SEEK Employment Index (SEI). The SEI includes a monthly count of vacancies posted on the SEEK website and the relationship between new job advertisements and applicants for new jobs. However, this indicator includes only vacancies from this site and does not disaggregate the data by detailed occupation. More detailed occupational data is required by immigration policy than SEEK provides.

The move to collect job vacancy information from online sources is happening overseas. Table 2 shows examples of these series. One example is the United States Conference Board replacing its long-standing newspaper-based Help Wanted (HW) series with an internet-based Help Wanted Online (HWOL) series. This HWOL series includes unduplicated advertisements from approximately 1,200 websites.

In summary, the Department of Labour developed *Jobs Online* to address the following:

- 1) The valuable information that job vacancy data can provide on the New Zealand labour market.
- 2) The shift from print to online vacancy advertising makes historical newspaper vacancy series redundant.
- 3) The detailed occupational breakdown is required to make the data useful to policy makers.

² A survey by the Recruitment & Consulting Services Association (RCSA) referred to in the Job Board Report (2010).

Methods

Compiling Jobs Online

The Department of Labour addresses five main issues in developing the new online vacancy monitoring programme, *Jobs Online*.

Firstly, the cost of processing the data is too expensive to continue manually. In the past, processing absorbed three full time workers to produce each monthly report. However, the number of online job advertisements in New Zealand doubled to an average of 30,000 per month between 2004 and 2007. It would take an estimated 2000 hours per month to code this many job advertisements manually.

Secondly, the change in the occupational classification system complicates the coding process. In 2006, Statistics New Zealand started shifting from the New Zealand Standard Classification of Occupations (NZSCO)—with 565 occupations, to the Australian and New Zealand Standard Classification of Occupations (ANZSCO)—with 998 occupations at the most detailed level.

The *Jobs Online* computer programme automatically codes each advertised job to one of these occupations using key words and phrases from the advertisement. When tested, the auto-coding programme correctly assigns a reasonable occupation code for 81% of advertised jobs, using a combination of seven matching methods. The *Jobs Online* programme also automatically removes duplicates within and between internet job boards.

The third issue is that jobs advertised online better represent skilled occupations than unskilled. In 2008 a survey of firms (the Business Operations Survey), estimated the number of true vacancies in New Zealand by occupation. Table 3 shows that the proportion of BOS vacancies covered by *Jobs Online* is higher for skilled occupations than for all occupations. As a result, the reporting of *Jobs Online* focuses on skilled vacancies.

The fourth issue is with data presentation. Due to the market sensitivity of the job board data, the Department of Labour has agreed to conceal the actual number of vacancies advertised online. In addition, monthly volatility in advertised vacancies requires an indexed trend series to seasonally adjust the data and show the change in advertised vacancies over time. This data is presented as an index with a base month of May 2007, set to 100.

The final issue is whether to collect vacancy information from advertised jobs online or from a survey of employers. Limitations of collecting advertised jobs from online vacancy advertisements include the following:

- 1) Not all vacancies are advertised online. There is no reliable estimate of the percentage of vacancies that are advertised for positions in

New Zealand firms. An internet based vacancy series excludes vacancies advertised in, for example: newspapers, social networking sites, and by word of mouth.

- 2) The number of online vacancies may be inflated by advertising and hiring practices, such as:
 - recruiters rewriting advertisements on the same site (duplicates can be removed only when the advertisement is the same)
 - the use of temporary or contract vacancies cannot be discerned from permanent vacancies in the administrative data. Temporary or contract positions temporarily inflate the demand for labour as they are more susceptible to turnover and sudden fluctuations.
 - advertisements may seek to fill more than one vacancy. In earlier research,³ 25% of advertisements for jobs listed in newspapers were for more than one position.

In summary, a vacancy survey collects information on all vacancies, minimising the impact of advertising practices.

However, to track changes in vacancies in New Zealand with a survey, a large sample size would be required. Vacancy surveys also rely on respondent knowledge and cooperation—especially an issue when surveying human resource managers for large firms. These managers may be unaware of all vacancies and may systematically choose not to participate.

The advantage of using online advertised vacancies is that the Department can use administrative data from internet job boards, reducing costs and allowing disaggregation by detailed occupation without sample limitations. For these reasons, the Department of Labour has decided to track advertised vacancies.

Results from *Jobs Online*

The Department of Labour released the first New Zealand edition of *Jobs Online* in December 2009. This monthly report tracks changes in the number of advertised vacancies by occupation, industry and region over time, using advertisements listed on SEEK and Trade Me Jobs.

Jobs Online provides an interesting perspective on the labour market in New Zealand, including the marked growth from the beginning of the series to March 2008, the recessionary period (particularly February 2008–July 2009) and the start of the recovery period from mid 2009.

³ Job Vacancy Monitoring Programme (JVMP)

Figure 3 shows that total monthly vacancies have grown consistently since June 2009, rising by 29.7% to May 2010. Skilled vacancies⁴ have increased by 26.6% since June 2009. Skilled vacancies did not fall quite so far or as fast as total⁵ vacancies over the recessionary period, according to *Jobs Online*.

The increase in vacancies since June 2009 pre-empted increases in employment and decline in unemployment seen in the three months to March 2010.

This change in vacancies has varied by occupation, industry and broad region. Figure 4 shows in vacancy change by industry. Vacancies fell in every industry at some point between August 2008 and April 2010. Construction and engineering were the first industries to fall in August 2008, whereas education and training vacancies were the last to decline (and by much less) in July 2009. Most industries began falling around June 2009. Healthcare and medical vacancies also began falling later than other industries in November 2008, but have picked up more recently (up 6.3% in the three months to May 2010).

Jobs Online shows similar trends to employment data by industry collected in the Household Labour Force Survey (HLFS). Employment in manufacturing and construction were the hardest hit during the recession, followed by hospitality—three industries that also show a strong decrease in vacancies over this period. Education and ICT have shown strong growth in employment in the year to March 2010—both industries have also shown strong growth in vacancies over this period.

Figure 5 shows that advertised skilled vacancies increased across most regions in the year to the end of May 2010. Growth was particularly strong in the North Island: vacancies in Wellington rose by 32.3%, in Auckland by 29.8% and in the rest of the North Island by 30.0%.

It is not surprising that vacancies in Auckland and Wellington have increased more quickly than vacancies in the South Island recently. The Auckland region suffered significant job losses during the recession with employment falling by more than the national average, however, there is strong recovery in these regions in the March 2010 quarter. In the South Island, a higher proportion of the economy is in industries still declining, such as agriculture, forestry and fishing.

Figure 6 shows that between occupations, the pattern of change in advertised vacancies is less varied. Vacancies for lower skilled occupations such as clerical and administration workers fell further during the recessionary period, but are now increasing at a faster rate.

⁴ Skilled occupations are defined as skill levels 1-3 under the Australia New Zealand Standard Classification of Occupations (ANZSCO). Skill level 3 is equivalent to an NCEA level 4 qualification.

⁵ Including all vacancies listed, as opposed to the Skilled Vacancies Index which includes skilled vacancies only.

Discussion

Comparing Jobs Online to proxy series

Historically, advertised job vacancies show a strong correlation with other indicators of the economy (see Silverstone, 2005), signalling that they are either or both:

- 1) A good representation of the changes in the actual number of vacancies in the economy
- 2) A good representation of how well the labour market and economy is functioning and what period of the business cycle we are in.

Job vacancies provide a measure of surplus or unmet labour demand. Conversely, the number of people unemployed provides an equivalent measure of surplus labour supply.

We expect changes in unemployment to have an inverse relationship with job vacancies for two reasons:

- 1) Excess demand, reflected in increasing job advertisements, drives an increase in the number of jobs available, pushing down the unemployment rate.
- 2) Changes in labour demand and supply affect the likelihood that employers need to advertise vacancies. An increase in labour supply leads to a decrease in the number of advertised job vacancies because employers can recruit without advertising. In contrast, when unemployment decreases, there is a diminishing supply of surplus labour, leading to job vacancies rising as employers try to hire suitable workers. As many job openings are filled by means other than advertising (such as word of mouth) an increase in advertised vacancies could indicate that employers are struggling to fill positions.

Unemployment rate

Figure 7 shows the unemployment rate in New Zealand in comparison to the change in the number of advertised vacancies included in *Jobs Online*. The short time series allows us to see three movements:

- 1) A short increase in vacancies at the start of the series and reasonably flat unemployment rate. During this period, the transition from print to online advertising was still taking place.
- 2) A large fall in vacancies, corresponding with a large increase in the unemployment rate.
- 3) A final short increase at the most recent end of the vacancy series—corresponding to a lagged decrease in the unemployment rate.

Figure 7 also shows a strong negative relationship between changes in unemployment and changes in the Skilled Vacancies Index (SVI) with a correlation coefficient of 0.95. This very strong relationship

indicates the potential for the SVI to be an early indicator of change in the unemployment rate.

Labour turnover

The Quarterly Survey of Business Opinion (QSBO), conducted by the New Zealand Institute of Economic Research, measures three key indicators that we might expect to correlate with vacancy change.

The first question relates to labour turnover:

Excluding seasonal variations, what has been your firm's experience during the past three months in respect of labour turnover?

Respondents can answer that labour turnover has increased or decreased over the last three months. The final labour turnover figure presents the net percentage of firms who said turnover had gone up minus the percentage who said turnover had gone down. Therefore, as the labour market softens and turnover goes down, the net percentage will fall.

We would expect that changes in vacancy growth will show a positive relationship with changes in labour turnover. Figure 8 compares the answer to this question with changes in advertised vacancies. A strong correlation of 0.69 was found between annual vacancy growth and the net balance of responses.

Difficulty finding skilled labour

The second question the QSBO asks refers to the difficulty of finding skilled labour:

Is finding the skilled or specialist staff you want today compared to three months ago harder, the same or easier?

The result is presented as the net percentage of firms who said it was easier to find skilled labour minus the percentage who said it was harder. Therefore, as the labour market softens and skilled employees are easier to find, the net percentage will rise.

Intuitively and from past experience with vacancy data, we expect that high vacancy growth will be associated with a greater difficulty in finding skilled staff.

Figure 9 compares *Jobs Online* against the net balance of responses (the percentage replying it is 'easier' to find skilled staff less the percentage replying 'harder'). A negative correlation of 0.91 was found to exist between annual vacancy growth and annual changes in the net balance of responses.

Labour as the main constraint on expansion

The third question the QSBO asks refers to the labour as the main constraint on expansion:

What single factor, if any, is most limiting your ability to increase production?

A shortage of labour is one of the six factors⁶ firms may select. It is expected that high vacancy growth will be positively related to the number of firms identifying a shortage of labour as their most limiting factor.

Figure 10 compares annual vacancy growth with annual changes in the number of people saying that labour is the single most limiting factor constraining production. There is a positive correlation of 0.92 between annual vacancy growth and annual changes in the proportion of firms identifying labour as being the limiting factor.

Additional information needed to interpret vacancy data

Given the strong correlation between *Jobs Online* and other indicators of the labour market described above, *Jobs Online* data may be preferable in many circumstances where timeliness is important.

Kettner and Stop (2008) identify three types of additional information needed to correctly interpret vacancy data: the replacement ratio, how hard to fill the vacancy is and information on labour market reforms.

Replacement ratio: the churn in jobs advertised is important as it shows whether the advertised vacancy was for a new job or to replace someone who previously filled the job. The churn is influenced by whether the job is temporary and the age and gender of the current workforce.

Hard to fill vacancies: when a vacancy is hard to fill due to labour market frictions the vacancy may need to be re-advertised. Skilled labour is often hard to find in a boom cycle. This contrasts with times when vacancies are easy to fill (bust cycle) and re-advertisements are necessary.

Information on labour market reforms: when there is a labour market reform the number of jobs available may change. For example, if there is an increase in the level of public health funding it is likely that there will also be an increase in the number of health jobs advertised.

All of these factors will need to be considered together in a detailed Beveridge curve analysis in New Zealand. Figure 11 shows the Beveridge curve with the three years of *Jobs Online* vacancy data available.

Summary

In this paper we described the methods used by the Department of Labour to create an online job vacancy monitoring series—*Jobs Online*.

We started by introducing the reasons why the Department of Labour created this series. We described the methods and presented the results. We also showed that overall, the job vacancy data tracks well with other labour market indicators such as unemployment.

If we were to carry out further analysis, we would study the Beveridge curve in New Zealand in relation to other countries.

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⁶ The other factors are sales, materials, finances, capital and other.

Figure 1: Beveridge Curve

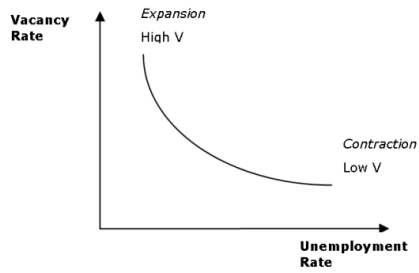
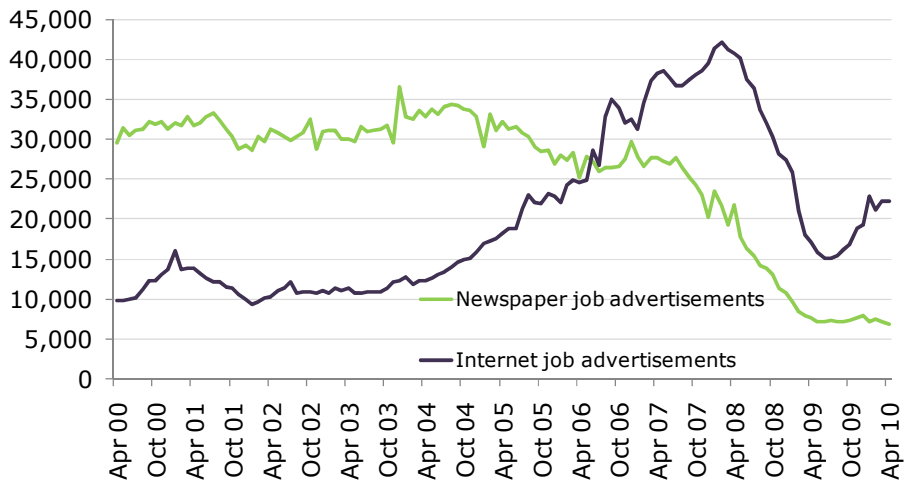


Figure 2: Comparison of the number of job ads appearing in newspapers and the internet



Source: ANZ series, Department of Labour

Table 1: Job vacancy series in New Zealand

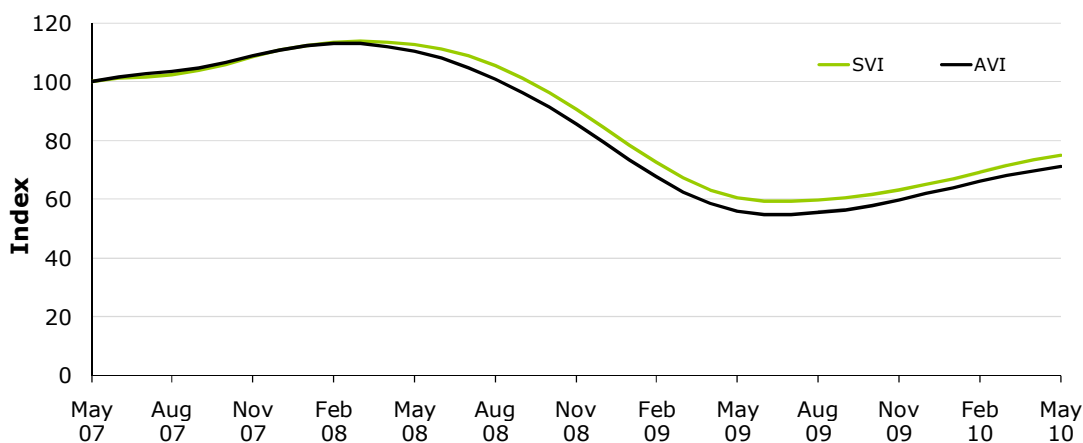
Series name	Year
Three official job vacancy series	1956 – 1989
ANZ Series	1990 – today
Job vacancy Monitoring Programme	2002 – 2007
SEEK Employment Index (SEI)	2009 – today
<i>Jobs Online</i>	2009 – today

Table 2: Job vacancy series overseas

Country	Type of data collection	Series name	Year
United States	Advertised vacancy count	Help Wanted Online	2005 - today
United States	Vacancy survey	Job Openings and Labor Turnover Survey	2000 - today
United Kingdom	Vacancy survey	Office for National Statistics' vacancy survey	2002 - 2008
European Communities	Both advertised vacancy count and vacancy survey	Statistical Office of the European Communities' job vacancy surveys	2002 - today
Australia	Vacancy survey	Job vacancies, Australia	1993 - May 2008 July 2010 - today
Australia	Advertised vacancy count	Internet vacancy index	2009 - today
Australia	Advertised vacancy count	Skilled vacancy index	1983 - today
Singapore	Vacancy survey	Singapore Manpower Research and Statistics Department: Labour Market Survey	1998 - today
Singapore	Vacancy survey	Singapore Manpower Research and Statistics Department: Job Vacancy Survey	1998 - today

Figure 3: Skilled Vacancies Index (SVI)* and All Vacancies Index (AVI)**

Trend series (May 2007=100)



* Skilled occupations are defined as skill levels 1-3 under the Australia New Zealand Standard Classification of Occupations (ANZSCO).

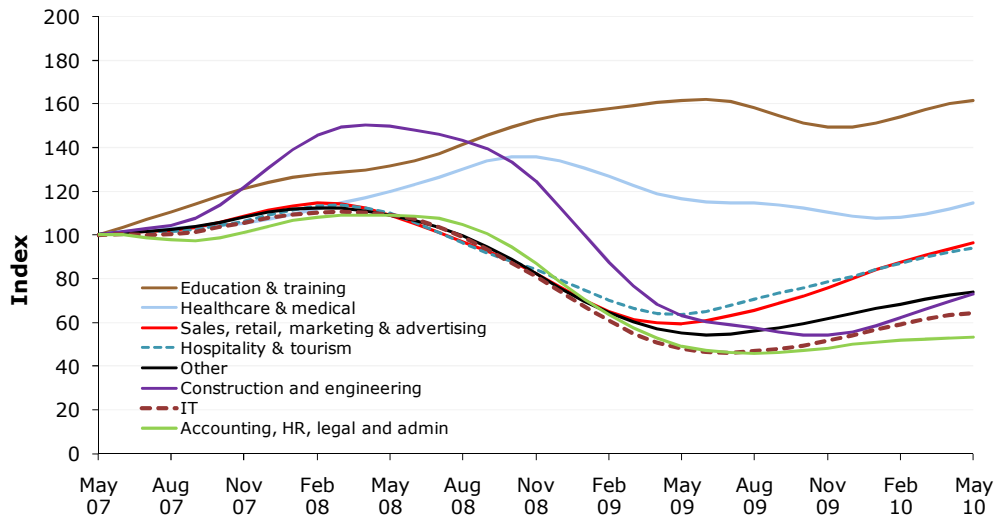
Skill level 3 is equivalent to an NCEA level 4 qualification.

** Including all vacancies listed, as opposed to the Skilled Vacancies Index which includes skilled vacancies only.

Source: Jobs Online (SVI trend series)

Figure 4: Skilled Vacancies Index (SVI) by industry group

Trend series (May 2007=100)

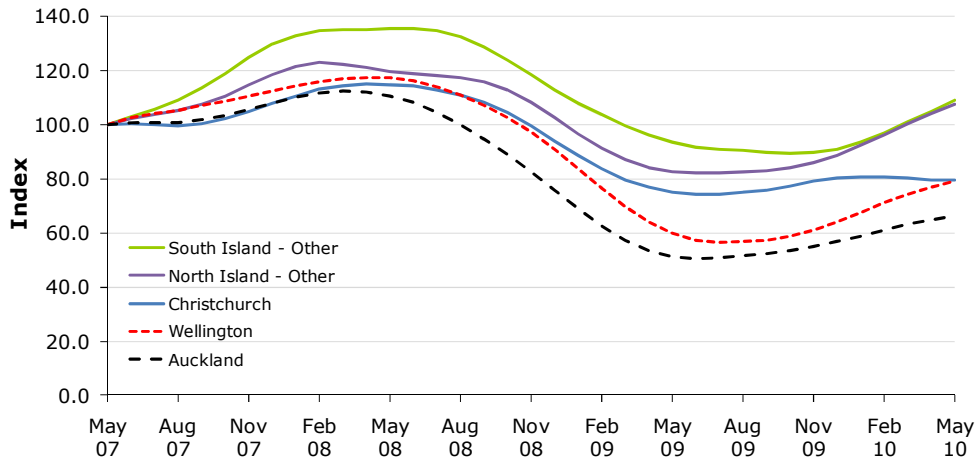


* Skilled occupations are defined as skill levels 1-3 under the Australia New Zealand Standard Classification of Occupations (ANZSCO). Skill level 3 is equivalent to an NCEA level 4 qualification.

Source: Jobs Online (SVI trend series)

Figure 5: Skilled Vacancies Index (SVI) by region

Trend series (May 2007=100)

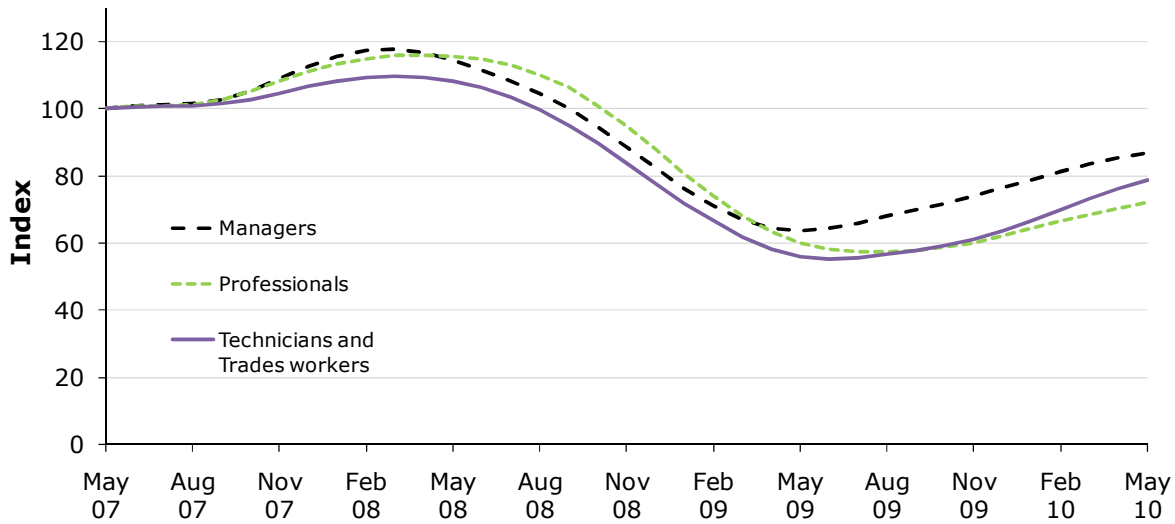


* Skilled occupations are defined as skill levels 1-3 under the Australia New Zealand Standard Classification of Occupations (ANZSCO). Skill level 3 is equivalent to an NCEA level 4 qualification.

Source: Jobs Online (SVI trend series)

Figure 6: Skilled Vacancies Index (SVI)* by Occupation group

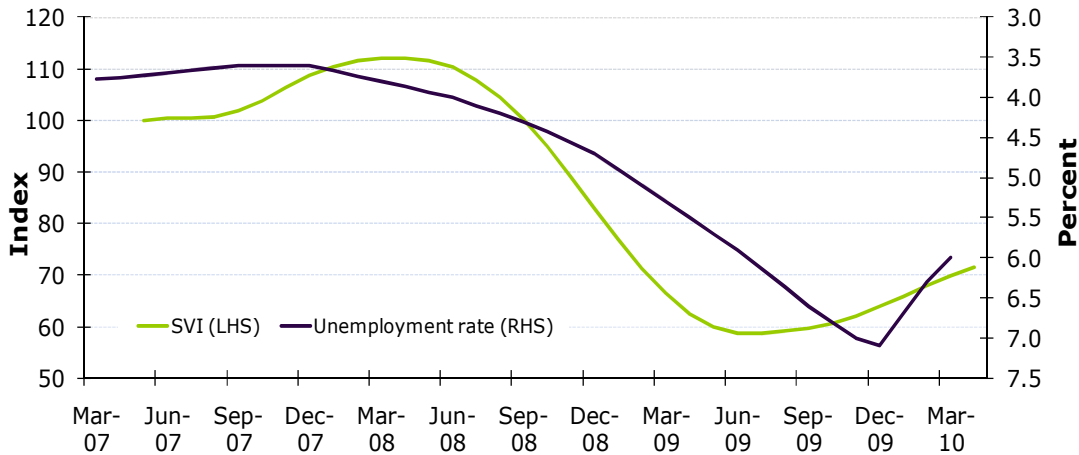
Trend series (May 2007=100)



* Skilled occupations are defined as skill levels 1-3 under the Australia New Zealand Standard Classification of Occupations (ANZSCO). Skill level 3 is equivalent to an NCEA level 4 qualification.

Source: Jobs Online (SVI trend series)

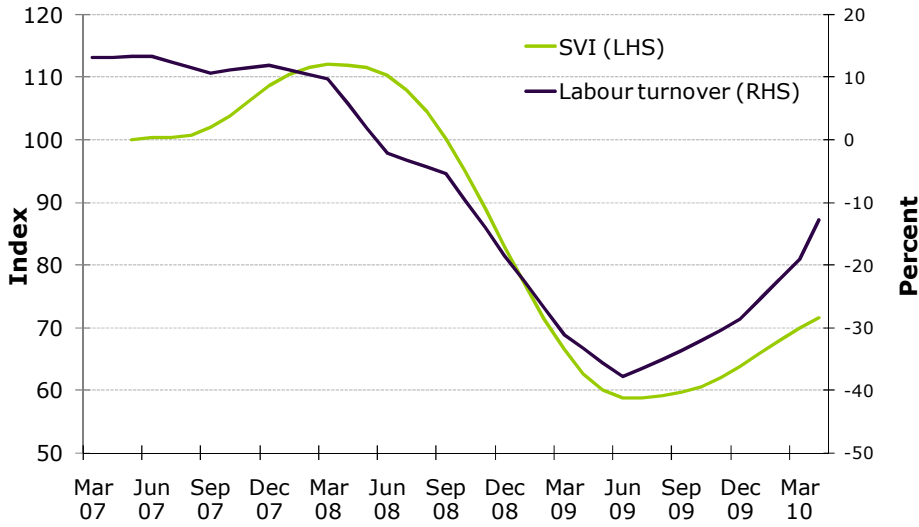
Figure 7: Unemployment rate and the Skilled Vacancies Index (SVI)*



* Skilled occupations are defined as skill levels 1-3 under the Australia New Zealand Standard Classification of Occupations (ANZSCO). Skill level 3 is equivalent to an NCEA level 4 qualification.

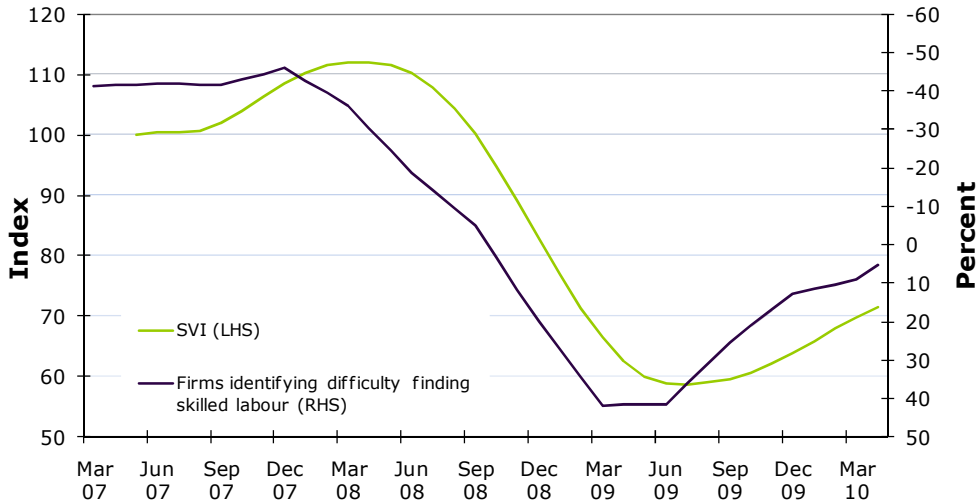
Sources: Department of Labour (SVI trend series) and Statistics NZ, (Household Labour Force Survey trend series)

Figure 8: Skilled Vacancies Index (SVI)* and labour turnover



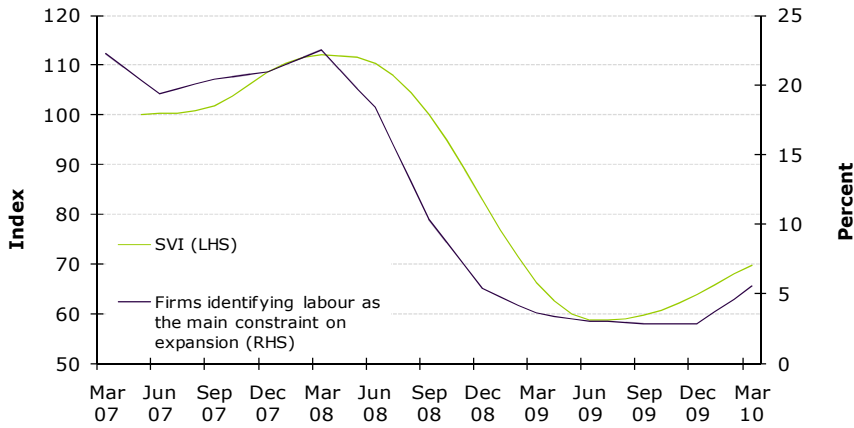
* Skilled occupations are defined as skill levels 1-3 under the Australia New Zealand Standard Classification of Occupations (ANZSCO). Skill level 3 is equivalent to an NCEA level 4 qualification.
 Sources: Department of Labour (SVI trend series) and NZIER (QSBO)

Figure 9: Skilled Vacancies Index (SVI)* and difficulty finding skilled labour



* Skilled occupations are defined as skill levels 1-3 under the Australia New Zealand Standard Classification of Occupations (ANZSCO). Skill level 3 is equivalent to an NCEA level 4 qualification.
 Sources: Department of Labour (SVI trend series) and NZIER (QSBO)

Figure 10: Skilled Vacancies Index (SVI)* and change in labour being the main constraint on expansion



* Skilled occupations are defined as skill levels 1-3 under the Australia New Zealand Standard Classification of Occupations (ANZSCO). Skill level 3 is equivalent to an NCEA level 4 qualification.

Source: Department of Labour (SVI trend series) and NZIER (QSBO)

Figure 11: Beveridge curve and *Jobs Online* vacancy data



Sources: Department of Labour and Statistics New Zealand (Household Labour Force Survey)

Table 3: *Jobs Online* as a percentage of the Business Operations Survey

NZSCO	BOS % of Total vacancies	ANZSCO	<i>Jobs Online</i> %	
			of Total advertisements	JOI as % of BOS
Managers	3%	Managers	13%	136%
Professionals	7%	Professionals	37%	183%
Technicians and associate professionals	3%			
Trades- persons and related workers	15%	Technicians and Trades workers	7%	17%
Total Skilled (Managers, Professionals, technicians and Associate Professionals, Trades)	29%	Total skilled (Managers, Professionals, Technicians and Trades)	56%	69%
Clerical sales and service workers	33%	Clerical and Administrative Workers, Sales workers	36%	39%
Labourers, production, transport or other workers	37%	Labourers, Machinery Operators and Drivers	4%	4%
	0%	Community and Personal Services workers	4%	
Low Skilled Jobs	71%		44%	22%
Total vacancies	100%	Total advertised vacancies	100%	36%

Sources: Department of Labour (*Jobs Online* vacancies) and Statistics New Zealand (Business Operations Survey)