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Job Vacancy Monitoring in New Zealand

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Abstract

The now widespread use of the internet as a source of information on job vacancies may have undermined the usefulness of newspaper advertisements - and possibly surveys - as the traditional sources of timely, cost-effective and accurate information on labour market openings. This paper outlines the New Zealand Department of Labour job vacancy series. This is followed by selected international illustrations, measurement options, job vacancy reporting and an assessment of the Department of Labour's experience with vacancy monitoring. The overall aims of this paper are to raise the awareness, in principle, of job vacancy data as a useful indicator of labour market conditions and the challenges, in practice, of creating appropriate series.

Key Words

job vacancies
job ads
vacancy statistics

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J63

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1. Introduction

Information on job vacancies tells us several very important features about the demand for labour. First, it tells us that there are employers willing to commit resources to advertising, interviewing, mentoring and paying an ongoing income to potential employees. In short, it tells us that there is work to be done. Secondly, vacancy data provide information about a major real outcome, namely, job openings for people to produce goods and services.

Thirdly, vacancy data are often available promptly and monthly. By comparison, data from New Zealand's Household Labour Force survey (HLFS) are only available quarterly and around six weeks after the end of each quarter. As a consequence, a vacancy series is potentially a valuable short-run leading macroeconomic indicator. In addition, if individual job openings are available, a vacancy series is, potentially, a valuable long-run microeconomic indicator of employment prospects.

Fourthly, job vacancy data may give us some indication, in conjunction with unemployment data, of the state of excess demand, or tightness, in the labour market. This can be shown more formally. Assume that all workers and all jobs are homogenous. Let the demand for labour (Ld) be expressed as the sum of those who are employed (E) plus vacancies (V), that is, $Ld = E + V$. Similarly, let the supply of labour (Ls) be expressed as the sum of those who are employed (E) plus those who are unemployed (U), that is, $Ls = E + U$. In equilibrium, the demand for labour equals the supply of labour, that is, $V=U$. Expressed alternatively, vacancies minus unemployment ($V-U$) is a measure of the excess demand for labour or labour market tightness. (See, however, the cautions discussed in Joseph 1975 and, on measurement issues, Morris 2003).

Finally, vacancy data, when used in labour market research, can give insights into the nature and stability of the vacancy-unemployment relationship (or the Beveridge curve), insights into how well people are matched to jobs and the likely influences on job matching or hiring. (See, for example, Bleakley and Furher 1997. For detailed New Zealand analysis see, for example, Dutu, Holmes and Silverstone 2008, Razzak 2008 and Silverstone 2005).

Section 2 of this paper provides a brief outline of New Zealand's job vacancy data with particular reference to the ANZ Bank and Department of Labour series. This is followed by selected international experience, measurement options, the Department of Labour's Job Vacancy Monitoring (JVM) programme and the possible scope of a vacancy monitoring report. The final sections cover an indication of further work and our conclusions.

2. New Zealand Job Vacancy Series

An official New Zealand job vacancy series began in 1956. It was discontinued in 1981. Its successor ceased in 1987. Yet another official series was discontinued in 1989. In 1990, the ANZ Banking Group began a monthly count of newspaper job advertisements. The initial

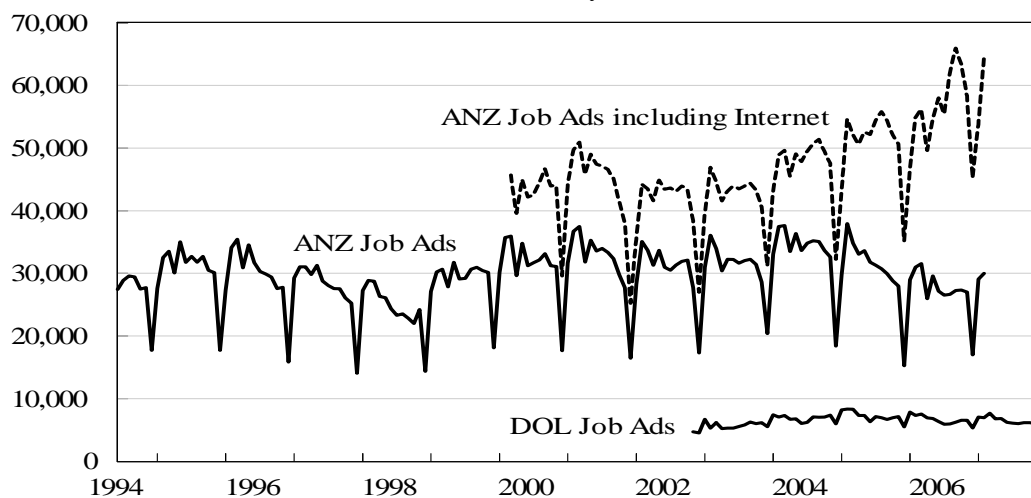
coverage of Auckland, Wellington and Christchurch newspapers was extended to four other regions (Waikato, Hawke's Bay, Manawatu and Otago) in 1994. From 2000, the newspaper count was supplemented with a count of internet job ads from major websites.

After some 17 years, the ANZ Bank ceased publishing its job ads series in 2007. (In the interest of continuity, the data are now collected by the Department of Labour). There were several reasons for the ANZ Bank decision. First, the series was not an individual job count: multiple jobs within one advertisement counted as one job, repeated ads within the same month were included and there was no separation of regional and national job ads within each newspaper.

Secondly, the ANZ found that 'duplicated job advertising counts from internet-based advertising made the series an unreliable economic indicator' (Steve Edwards, personal communication, 2008). In contrast, the Department of Labour confined its job vacancy measure mainly to newspaper advertisements, apart from information technology jobs. The ANZ and DoL views may be compared with Silverstone (2005) who found, from several perspectives, that internet and newspaper job ads combined had a stronger relationship with unemployment, skill shortage indicators and labour constraints than newspaper advertisements alone, at least over the period 2000-2004.

Thirdly, from 2002, the DoL began publishing a monthly count of individual job advertisements appearing in 25 main daily newspapers. This new vacancy series, as Figure 1 shows, avoids the significant duplication arising from the raw ANZ job counting. The impact of internet advertising, however, is clearly omitted from the DoL series.

Figure 1. Job Advertisements in New Zealand
1994-2007, Monthly, Number



Source: ANZ Banking Group and Department of Labour.

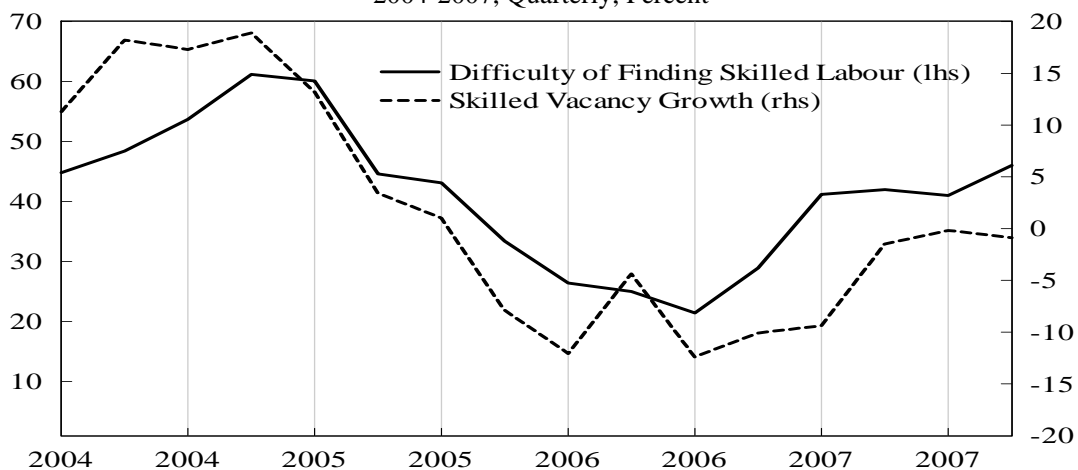
3. Job Vacancy Monitoring Programme

The Department of Labour's Job Vacancy Monitoring (JVM) programme is currently New Zealand's most recent job vacancy series. It is a sample only of vacancies published on the first main advertising day of each month (usually the first Saturday). Jobs are classified at the NZSCO (New Zealand Standard Classification of Occupations) 1, 2 and 5-digit levels thereby identifying more than 600 occupations. Urban and regional classifications are also available. Detailed reports, data and notes are published on the Department of Labour (2008) website.

The JVM series was created initially to provide a sample for the Survey of Employers who have Recently Advertised (SERA). It was found subsequently to be useful in tracking macro and micro labour market outcomes. One particular macro theme has been monitoring the change in job advertising. In particular, JVM has been used by the Department as a source of labour market information not only on labour demand but also on labour market 'tightness' or labour demand and supply. The latter perspective is based on the argument that employers may advertise formally only when other methods fail (such as head-hunting, in-house, shop-window and word-of-mouth advertising). If this view is correct, JVM may also be capturing the change in hard-to-fill vacancies, implying that an increase in vacancies indicates an increase in labour market tightness.

Support for the vacancy 'tightness' view is illustrated in Figure 2 by the close relationship between skilled vacancy growth and the net balance on the difficulty of finding skilled labour (from the NZIER's *Quarterly Survey of Business Opinion*). When the effects of employment growth are subtracted from skilled vacancy growth, the relationship is particularly strong between March 2004 and May 2006 (with a correlation of 0.93). After news-paper advertising eased relative to internet advertising, however, this relationship appears to have weakened significantly (with a correlation of 0.47) between March 2004 and September 2007.

Figure 2. Vacancy Growth and Finding Labour
2004-2007, Quarterly, Percent



Source: Department of Labour and NZIER.

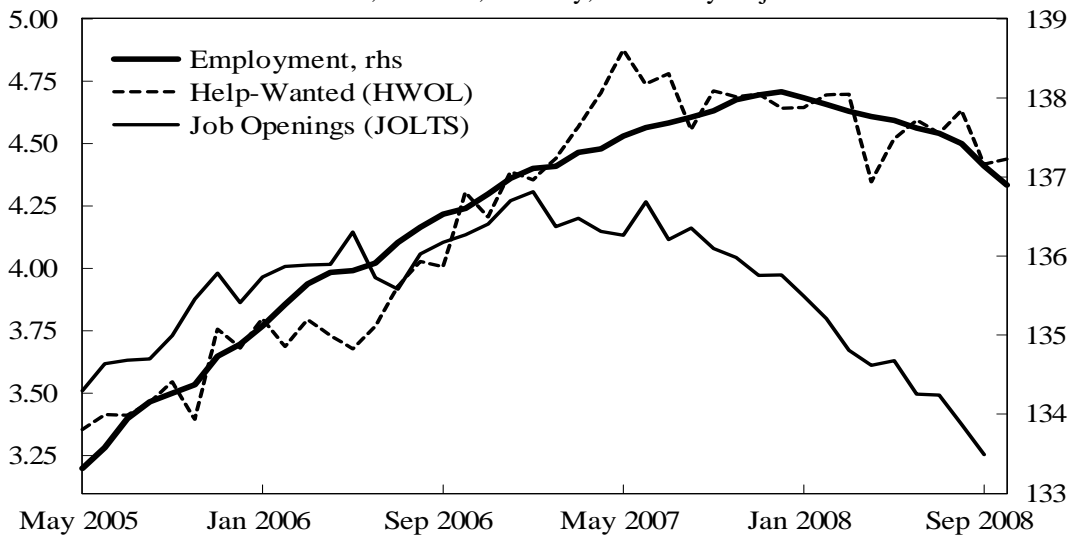
In May 2008, the Department of Labour ceased publishing its job vacancy series saying that the decision was based ‘on concerns that the JVM figures, which were gathered from newspaper advertisements only, may no longer be a reliable representation of labour market change because of the growth of internet advertising. As soon as a new system is in place, the Department will resume publication of an advertised vacancies series’ (Department of Labour 2008, p.1).

4. Recent International Experience

These issues - the usefulness of job vacancy data and the integration, or otherwise, of internet and newspaper job advertisements - have been encountered elsewhere. In 2005 in the United States, for example, the Conference Board replaced its long-standing newspaper-based Help Wanted (HW) series with an internet-based, online Help Wanted (HWOL) series. The online series comprises unduplicated advertisements from some 1,200 web sites. Slightly earlier, in 2002, the United States Department of Labor began publishing a survey of Job Openings and Labour Turnover (JOLTS). This series is an establishment-based sample survey of some 16,000 firms in both the private and public sectors.

Figure 3 compares the United States HWOL and JOLTS series against employment and against each other between May 2005 and September 2008. The correlation of each vacancy series with total, nonfarm United States employment is a very impressive 0.96 with HWOL but just 0.21 with JOLTS. If, however, employment and JOLTS are compared over their longer common period (2000-2008), the correlation is greatly improved at 0.77. The correlation of JOLTS and HWOL (2005-2008) with each other is relatively low at just 0.24. Could one conclude, initially, that the online series (HWOL) is better at detecting employment cycles (ex post and/or ex ante) than the survey-based series (JOLTS)?

Figure 3. United States Vacancies and Employment
2005-2008, Millions, Monthly, Seasonally Adjusted



Sources: United States BLS and Conference Board.

In Australia, a survey-based series 'Job Vacancies, Australia' ceased publication in May 2008. No publicly-stated reasons for this decision appear to have been given. In the United Kingdom, in 2002, the Office for National Statistics (ONS) began publishing the results from a monthly, establishment-based job vacancy survey from around 6,000 firms. (For details, see Machin and Christian 2002 and Machin 2003). Firms respond directly to the ONS via telephone keypad to an 0800 number. Respondents are asked just one question:

How many job vacancies did your business or organisation have on [date] for which you were actively seeking recruits from outside your business or organisation?

Eurostat (the Statistical Office of the European Communities) publishes job vacancy data for most member countries with data obtained typically from representative stratified sample surveys of business firms. Eurostat (2008) define a vacancy somewhat similarly to the UK:

A post (newly created, unoccupied or about to become vacant) which an employer (a) is taking active steps to find a suitable candidate from outside the enterprise concerned and (b) intends to fill either immediately or in the near future.

They define the job vacancy rate as:

The ratio of the number of job vacancies to the sum of the number of occupied positions and job vacancies.

Both Eurostat and ONS, and most Eurostat countries, exclude from their vacancy definitions posts that are open only to internal candidates.¹

5. Measurement Options

While there is broad agreement on the definition of a vacancy, measurement options differ significantly. These options include having no direct vacancy series at all, using jobcentre vacancy data, newspapers, the internet, some mix of newspaper and internet ads or a survey-based vacancy series.

The 'no vacancy series' option would imply, among other things, that there is no cost-effective, value-added information to be gained from the timely release of direct vacancy data for either operational or research purposes. This conclusion may be correct. It would, however, be somewhat against the trend in the OECD and European Communities towards either commencing or enhancing the publication of vacancy series. Presumably this trend is occurring for the reasons listed in our introduction.

¹ Given the attention that vacancy data are receiving currently, it is surprising that the academic literature on the definition, measurement and interpretation of a job vacancy is relatively dated. (See, for example, Holt and David 1966, Joseph 1975 and Muysken 1994. A recent exception is Machin and Christian 2002).

It should be noted, however, that indirect, or proxy, vacancy data are available in New Zealand. The NZIER's *Quarterly Survey of Business Opinion*, for example, includes qualitative questions on the difficulty of finding skilled and unskilled labour, numbers employed and the extent to which labour is a constraint on activity. The survey results for these questions for the September quarter of 2008 are shown in Table 1.

Table 1. QSBO Labour Responses September 2008
Economy-wide, Percentage of 915 Replies

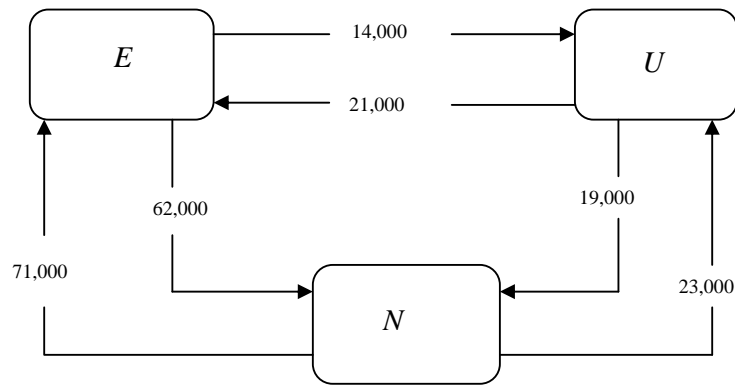
• Finding the staff you want today compared with three months ago is:						
	Easier	Same	Harder	NA		
Skilled	15	60	20	5		
Unskilled	23	56	9	11		
• Regarding employment in your firm, what did you experience over the past quarter and what do you expect over the next quarter?						
	Up	Same	Down	NA		
Past Quarter	18	53	28	0		
Next Quarter	18	56	26	0		
• What single factor is most limiting your ability to increase your activity?						
	Sales	Materials	Finance	Labour	Capacity	Other
	68	2	7	10	8	5

Source: NZIER *QSBO* (190) September 2008, p.30.

The net balance on the difficulty of finding skilled labour, for example, is -5 percent calculated from the formula [(easier-harder)/100-NA] where *NA* means no answer or not applicable. The June quarter outcome (not shown in Table 1) was -18 percent. This quarterly change implies that it has become easier, or 'less hard', to find labour. One could also say that it implies there were fewer skilled vacancies in the September quarter of 2008 compared with the June quarter. Figure 2 illustrates this relationship between 2004 and 2007 (using absolute values for the net balance). A similar interpretation applies to the other responses in Table 1, namely, that movements in employment and the labour constraint could be interpreted as being matched qualitatively by movements in vacancies. The data in Table 1 can be further disaggregated by region, by sector (manufacturers, builders, merchants and services) and by principal activity.

Another series that could, potentially, be used as a proxy for vacancies uses the gross flows data from the Household Labour Force Survey (HLFS). Recall that all persons are either employed (*E*), unemployed (*U*) or not in the labour force (*N*). As the gross flows data matches respondents in adjacent quarterly surveys, it is possible to obtain a sense of vacancy movements from the dynamics of the flows and flow rates into and out of *E*, *U* and *N*. In Figure 4, for example, the 21,000-person *U*-to-*E* flow represents new hires and recalls, that is, the filling of vacancies from unemployment. Vacancies can also be filled from *N*. (See Silverstone 2001 and 2005 for further details).

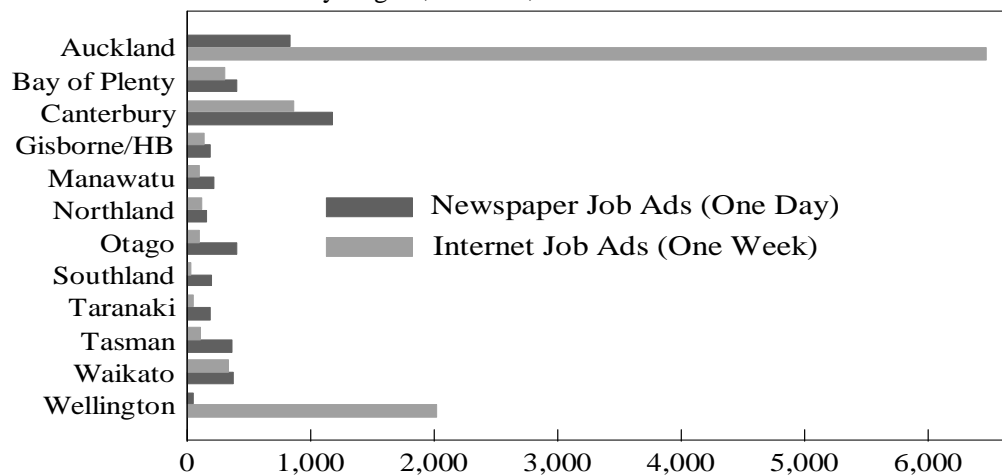
Figure 4. Gross Flows between Labour States
 March and June Quarters 2008, Persons



Source: Statistics New Zealand, Household Labour Force Survey.

The ‘newspaper only’ option, as the Department of Labour and other organisations and countries have found, is, with some qualifications, probably no longer a reliable indicator of labour market conditions due to the advent and rapid growth of internet advertising. A DOL study, however, found that newspaper advertisements still dominate in some regions. First, as illustrated in Figure 5, newspapers dominated in Canterbury and in most of the smaller rural areas of New Zealand. Secondly, while internet advertising held the largest proportion of advertisements in management and professional occupations, newspaper advertising recorded the biggest occupational proportions in the trades and elementary jobs. Thirdly, the study also found that community newspapers did not hold a proportion of any particular occupation or region and, as a result, they should not be added to the existing newspaper coverage which uses the main daily papers.

Figure 5. Newspaper and Internet Advertising
 By Region, Number, November 2007



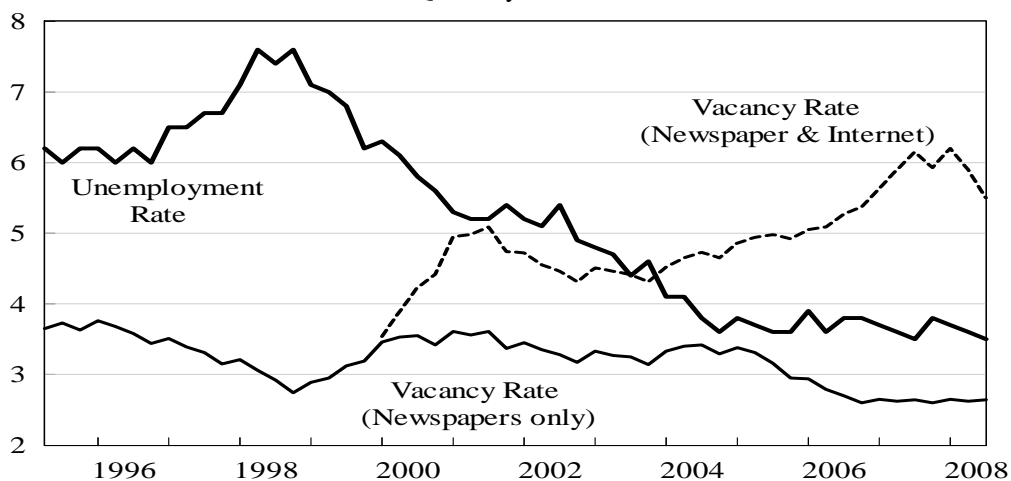
Source: Department of Labour.

Mixing newspaper and internet job vacancies may not currently be an appropriate option either without knowing, for example, the proportion of vacancies filled in response to internet and/or newspaper advertisements. Dean (2005, p.15) says, from her experience with the ANZ Bank (Australia) job ads series, that ‘so far, no statistically robust relationship exists between total (newspaper plus internet) job ads and employment growth’. There is a case, then, for proceeding cautiously on aggregating newspaper and internet ads until the characteristics of internet ads are better understood and the aggregation and duplicate-removal processes are made consistent. (See Kuhn 2000 and Kuhn and Skuterud 2000).

The remaining measurement options are to use internet data or firm-based surveys. Both options are attractive and, as noted above, are being used, for example, by the US Conference Board (internet) and by the US Department of Labour, British Office for National Statistics and Eurostat (surveys). (See Department of Labour 2003 for an overview of several survey options).

Before considering the Labour Department’s review and consultations on its vacancy monitoring programme, it is instructive to plot, in Figure 6, New Zealand’s unemployment rate against two vacancy rates, namely, newspaper ads and newspaper and the internet ads combined (both divided by the labour force). Unemployment and the combined vacancy series have the expected inverse relationship. Their correlation between 2000 and 2008 is relatively strong at -0.78. The correlation between the unemployment and newspaper series over the same period is wrongly signed at 0.72. On the other hand, between and 1995 and 2000, before the impact of internet advertising, the correlation between the unemployment and newspaper vacancy rates was highly significant at -0.87. Clearly, there is a problem with the information content of the newspaper-only vacancy series.

Figure 6. Unemployment and Vacancy Rates
Quarterly, Percent



Sources: Statistics New Zealand and Department of Labour.

6. Job Vacancy Monitoring Assessment

In early 2008, as a result of a rapid growth in internet job ads, the Department of Labour began an assessment of its newspaper-based vacancy monitoring programme. This assessment included an internal review of JVM and an external consultation with interested parties.

The review resulted in several observations and issues to be resolved. First, counting internet advertisements every day (rather than one day a month with newspaper ads) would enable both changes in vacancies and total vacancy counts to be considered. Secondly, countries elsewhere were in the process of establishing online vacancy series. Thirdly, internet job advertising was expected to stabilise once the impact of 'new users' became less significant.

Disaggregation and duplicate removal were identified as major issues. Consider, first, disaggregation and data processing. The present 5-digit occupational level was established to meet requests by interested parties for detailed information on the labour market. Should the data continue to be separated by region, occupation and skill level?

Attempting to code the volume of advertising at an occupational digit level presents a challenge with internet data. In July 2008, the Department attempted to create an auto-coder of job advertisements to a 4-digit ANZSCO (Australia and New Zealand Standard Classification of Occupations) code. The auto-coder used key words from the title and job description and matched them to the ANZSCO code using its job description and task list. Despite a thorough attempt, the auto-coder only assigned the same ANZSCO code as a manual coder for 50 percent of job ads. To increase this level of accuracy, resource-intensive manual coding would have to be used on a large proportion of vacancy data. On the other hand, regional coding has a very high level of accuracy as employers almost always provide this information.

The identification and removal of internet job ad duplicates is a further major issue. This is a more difficult task with internet ads compared to newspaper ads where manual processes can be used on the small volume of data. At the moment, duplicates can be detected within an internet job board, but not across job boards. Duplicates can also be recognised based on the job title, description and location field given by data providers. Often, however, advertisements are altered by recruitment companies or by employers themselves between or even within job boards. As a result, the number of advertisements increases with possibly an altered distribution across occupations and regions. This outcome could occur especially when the labour market is tight and employers are making a greater effort to recruit.

The internal review was supported by a two-part consultation process. The first part involved consultation with four vacancy researchers. The following questions were among those posed to this group:

- What does an advertised job vacancy series tell us about the labour market?
- Is the frequency of data (monthly, quarterly, half-yearly) important?
- Is it appropriate to combine newspaper and internet vacancies and, if so, how?
- How should vacancy data be presented?

The consultation process resulted in several findings. First, there was qualified support for a monthly job vacancy series. Secondly, interpreting changes in vacancy measures was a major issue for all researchers. Some members of the group, for example, regarded the vacancy rate as a tightness indicator while others were less convinced. Thirdly, opinion was divided on whether to combine newspaper and internet vacancies. Fourthly, some members favoured publication of the data alone while others favoured data and a commentary linked to vacancy-related variables.

The second group involved in the consultation process included vacancy users ranging from government officials and regional policy analysts to private sector advisers. The following questions were among those posed to this group:

- What does an advertised job vacancy series tell us about the labour market?
- Is it important that skill, regional and occupation-level data are provided?
- How are vacancy data used in your information-sharing and decision-making?

While the response rate was relatively low, several views emerged. First, there was a preference for raw data as an indicator of labour market vacancies rather than an index. Secondly, respondents wanted occupational and regional data rather than national level or even skill level data. Thirdly, there was a concern about duplicates in the data.

The Department also conducted negotiations with three major internet job boards: *SEEK*, *TradeMe* and *Herald Jobs*. The purpose of the negotiation was to establish whether internet job advertisement data could be received by the Department of Labour on a monthly basis. The negotiations were very successful. The Department, however, was only able to collect a limited number of fields, making it more difficult to remove duplicates and to recognise and assign job advertisements to occupational codes.

Overall, the Department's internal review and external consultations revealed that vacancy data were useful to a wide range of interested parties, there were different interpretations of the data and different data requirements. The results of the review and consultation will form part of the Department's decision on whether to publish a job vacancy series.

7. Job Vacancy Reporting

The availability of vacancy data provides an opportunity for additional labour market information. Ideally, job vacancy data should be collected consistently with household labour force data. If this occurred, then comparative results and charts could be included in (official) media releases as illustrated in Table 2 (where the dots represent unavailable, consistent data).

Table 2. Key New Zealand Labour Market Outcomes
June 2008, Seasonally Adjusted

	June Quarter	Quarterly Change	Annual Change
Unemployment Rate	3.9%	+0.2	+0.3
Unemployed	89,000	+8.7%	+10.1%
Employed	2,169,000	+1.2%	+0.7%
Not in labour force	1,034,000	-2.5%	+1.4
Participation rate	68.6%	+0.9	-0.1
Vacancies
Vacancy rate

Source: Statistics New Zealand.

In addition to the vacancy levels and rates in Table 2, regional and occupational results could also be included. Furthermore, there might be a case, possibly in Department of Labour releases, to report vacancy data alongside such series as the NZIER's *Quarterly Survey of Business Opinion (QSBO)* and the HLFS Gross Flows data. As already noted, *QSBO* includes questions on the difficulty of finding skilled and unskilled labour, employment experience and intentions and the extent to which the availability of labour is a constraint on a firm's ability to increase production. The flows data includes information on labour market dynamics involving persons employed, unemployed and not in the labour force. In the UK, vacancy data are released monthly as an official national statistic. Table 3 shows the year-on-year changes in UK vacancies and, by implication, the valuable information content of a promptly-available statistic.

Table 3. United Kingdom Job Vacancy Statistics

2008	Thousands	Annual Change
March	698.9	9.0 %
April	665.2	3.7 %
May	655.3	2.6 %
June	652.7	-4.4 %
July	634.1	-9.8 %
August (revised)	599.3	-9.2 %
September (revised)	636.6	-9.0 %
October (provisional)	597.6	-18.8 %

Source: UK Office for National Statistics.

8. Further Work

Further work could cover several areas. First, what is best practice in vacancy gathering and reporting? Secondly, what is the proportion and type of jobs filled as the result of internet searching compared to other search methods. (See Kuhn and Skuterud 2000). Thirdly, what is the proportion of all vacancies captured by advertised vacancies? Do advertised vacancies, for example, follow a different trend to all vacancies? If there is an increase in advertised vacancies, can we be sure that this is caused by an increase in all vacancies (demand for labour) and not, for example, by a decrease in the cost of advertising? Fourthly, will internet advertising continue to be the dominant form of advertising job vacancies? Video advertising, for example, and social network advertising (such as Facebook) may become more dominant online.

9. Conclusions

We began this paper by listing five useful features of a job vacancy series. Compiling and interpreting a vacancy series, however, poses major challenges including measurement choices, duplicate removal, the level of disaggregation, consistency with employment and unemployment data and cost. Ultimately, the usefulness of a job vacancy series depends on whether it is a source of timely, cost-effective and accurate information on labour market openings. Recent American and British experience suggests that the construction of a vacancy series from either duplicate-free internet or survey-based advertising may meet these tests of usefulness.

Job vacancies mean that people are needed as opposed to unemployment meaning that people might not be needed. We usually hear rather more about unemployment than we do about vacancies. This information imbalance may create misleading signals for employers, employees and analysts, hence the ongoing research into providing reliable macro and micro vacancy data.

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