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Hard-to-fill vacancies: An analysis of demand side responses in the Australian state of Queensland

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ABSTRACT

This paper provides an analysis of the determinants of job vacancy durations in Queensland. This is done by using a Cox Proportional Hazard model to analyse data generated by an employer survey. Analysis indicates that important determinants of vacancy duration include the skill level of the vacancy, the accessibility of the region of the vacancy, and the size of the firm advertising the vacancy. Wage offers are found to have a confounding effect, with higher wage offers apparently associated with longer duration. However, an ancillary regression uncovers evidence of wage posting. Surprisingly, little evidence of variation in vacancy duration across industries is found. Results from a proportional hazard model with shared frailty based on the firm advertising the vacancy, suggest unobserved heterogeneity is also important.

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1. Introduction

By way of introduction, the Queensland Labour market in 2011/12 (the time at which these data were collected) was beginning to recover from the demand shocks that had been associated with the Global Financial Crisis (GFC). Specifically, Gross State Product (GSP) grew at a rate of 2.5% compared to 0.9% for the previous year, although it remained below the trend rate for the last decade of 3.3%. While this increased economic growth had some positive impact on employment levels, this impact was muted, the unemployment rate stayed at 5.5% (slightly above the Australian average of 5.2%) and highlighted the difficulty the Queensland economy has in translating GSP growth into employment growth. Part of reason for this is the relatively long duration of vacancies and the persistence of hard to fill vacancies across most industries.¹ The recovery of the Mining industry, with its tendency to pay efficiency wages placed increased recruitment pressure on those industries, particularly in Manufacturing industries that require similar skills to the Mining industry but without the capacity to pay above market wage rates.²

Broadly speaking, it is recognized that hard-to-fill vacancies and/or skills shortages arise on the supply side of the labour market through bottlenecks in training and labour immobility and on the demand side of the labour market through inappropriate employer responses to price and non-price signals within the labour market.

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¹ See, Queensland Treasury (2012) "Budget Strategy and Outlook 2011–12" <https://www.treasury.qld.gov.au/.../state.../2011-12/state-finances-report-2011-12.pdf> and Green (2011) "Recruitment and retention Issues in Rural Labour Markets" *Journal of Rural Studies* 27(2), 171–180.

² See, The Australian Institute (2013) "The Impact of the Mining Boom on Non-Mining Industries in Australia, <http://www.tai.org.au/sites/default/files/Australia%20Institute%20Mining%20economic%20impacts%20AUG%202013.pdf>.

This acknowledgement of the importance of both sides of the labour market on the duration of vacancies is nothing new. In their dynamic theory of the labour market, [Holt and David \(1966\)](#) considered both workers search and employers search as important mechanisms which determine the functioning of the labour market. In their explanation, the hiring of a worker is viewed as resulting from a search process through which a non-standard worker and a non-standard job are matched to satisfy certain wage and skill criteria. In this explanation, understanding the determinants of both the duration of unemployment spells and the duration of job vacancies were viewed as equally important.

However, in theoretical as well as empirical research following [Holt and David \(1966\)](#), the study of job vacancies had not received much attention. [Chen and Eriksson \(2009\)](#) note that a paucity of data was largely responsible for this outcome. Notable and recent exceptions to this include [Healy et al. \(2015\)](#) and [Sharma et al. \(2016\)](#). Both of these studies use Australian data to examine the causes and consequences of skill shortages from an employer perspective. Nevertheless, the bulk of research, both in Australia and overseas, has focused on supply side issues, exploring factors responsible for unemployed person's job search patterns and the duration of unemployment (see, for example, [Lancaster, 1979](#); [Nickell, 1979](#); [Mortensen, 1986](#); [Kiefer, 1988](#)). This paper, in contrast, is concerned with the demand-side issues. It concentrates on the specific difficulties faced by Queensland employers in filling vacancies and how these difficulties vary by industry, occupation and region. The results from this paper provide timely and interesting comparisons with the two recent studies using Australian data, listed above. Importantly the paper also considers the role played by wage responses by employers in filling vacancies. In contrast to [Healy et al. \(2015\)](#) and [Sharma et al. \(2016\)](#) who were unable to consider this aspect of skill shortage due to data constraints.

Hard-to-fill vacancies and job vacancies that last too long can be a serious problem. [Van Ours \(1989\)](#), notes that there may be two reasons for this. In the first place, they may indicate that a large share of the unemployed are considered as non-mediatory. Secondly, these job vacancies may inhibit firms from achieving their growth potential, reduce productivity and result in a decrease in capital investment. For these reasons, analysing the determinants of job vacancy duration may lead to valuable information about the function of the labour market and about the possibilities for firms and government policy makers to shorten the duration of job vacancies. In this paper, data from a survey showing the experiences and responses of employers who advertised job vacancies are analysed using a proportional hazard model.

The paper proceeds in the following way: Section 2 outlines a theoretical model of job vacancies while Section 3 outlines the data and the variables used in the analysis. Section 4 presents and discusses the results of the modelling exercise and contains an empirical test of the wage posting hypothesis. Finally, Section 5 provides the conclusion and a discussion of the policy implications arising from the results.

2. A theoretical model of job vacancies

The analysis of job vacancies in Australia, particularly their duration, is often treated as being related to the level of skill being sort and analysed under the category of skill shortages.³ This is in keeping with the common practice of approaching the topic of unfilled job vacancies from the supply side, where issues of skill deficiencies and workforce immobility are highlighted as the major constraints ([OECD, 1994](#); [OECD, 1996](#)). While this paper recognizes the importance of supply side imbalance on the duration of job vacancies by specifically including a skill index variable within the modelling, it expands the traditional approach by recognizing the importance of demand side issue. This follows on from the work of [Adams et al. \(2002\)](#) who examined the issue of unfilled job vacancies from the demand side; focusing on the characteristics of employers, job openings and recruitment policies as well as the role played by prevailing economic conditions. The authors used a survey of UK employers to argue that job vacancies occurring in an environment of high unemployment result not only from supply side issues, but also from a mismatch of employer and job-seeker expectations caused by an asymmetry of information between these two groups.

The results of [Adams et al. \(2002\)](#) provide evidence of the importance of employer and job-specific factors on the flow of people into job vacancies. In the same vein, [Houston \(2005\)](#), in his study of US and UK metropolitan labour markets, argues that the skills mismatch approach in vacancy analysis pays insufficient attention to the potential of the demand side of the labour market to cause delays in filling vacancies.

Two recent studies; [Mavromaras et al. \(2015\)](#) and [Sharma et al. \(2016\)](#) have cast light on the range of options open to employers in responding to hard to fill vacancies and the potential costs to employers of not filling vacancies in a timely manner. [Healy et al. \(2015\)](#) used the Australian Business Longitudinal Database (ABLD) to examine the pattern of unfilled vacancies in Australia and employer responses to these vacancy issues. Specifically, their study investigated (1) the determinants of different types of skill shortages (2) the response strategies by employers to these shortages, including hiring policy and (3) the short term consequences on company performance from having unfilled vacancies. The authors distinguish between simple and complex vacancies in terms of difficulty in filling but find, somewhat surprisingly, that employers respond in a similar manner to solving the vacancy issue for both categories. These strategies were increasing working hours for existing staff, redesigning job types and outsourcing. Sharma et al. used a much smaller and region specific survey data base in their study but reached similar conclusions. They found (anecdotally) that firms were reluctant to vary

³ See, for example, [Song and Webster \(2003\)](#) "How Segmented are Skilled and Unskilled Labour markets: The Case of Beveridge Curves" *Australian Economic Papers*, Vol. 42, pp. 332–345, September and [Shah and Burke \(2005a,b\)](#) for discussion of the extent and causes of skill shortages in Australia.

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