On the Relationship between Employment and Vacancies

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Abstract The aim of this paper is to test whether there is empirical evidence of two Beveridge curves for male/female vacancies. This paper uses data from the Australian Bureau of Statistics (ABS) labour force surveys and vacancies surveys to study the relationship between job vacancies and unemployment over the period 1983-2005. The central discoveries are the existence of distinct male/female Beveridge curves and the surprisingly ineffective role played by part-time vacancies in reversing this distinction, principally by its inability to reduce female unemployment in the long-run.

Keywords: unemployment, casual employment, part-time employment

JEL Classification: C22, E24

1. Introduction

This paper uses data from the Australian Bureau of Statistics (ABS) labour force surveys and vacancies surveys to study the relationship between job vacancies and unemployment over the period 1983-2005. The approach to the estimation of the Beveridge curve focuses on the cyclical relationship between unemployment and vacancies, and is achieved through the application of the Hodrick and Prescott (1997) (HP) filter.

The results of the study highlight different outcomes between men and women. Permanent vacancies, for example, appear to be matched more easily with male employees. We also show that unemployment is not very responsive to part-time job vacancies, especially for women.

A recent application of the HP filter to the inflation rate and the natural rate of unemployment by Hsing (2007), revealed that monetary easing or large deficit spending may cause the inflation rate to accelerate. It suggests that expansionary policies increase unemployment when unemployment is low, contrary to standard theory, but nevertheless can be explained by considering the impact of firms’ hiring policies on the value of labour.

The discovery that part-time vacancies have an atypical impact on female unemployment is an important one, and attempting to explain it is the aim of this paper. We propose that the persistence of family responsibilities on women’s role in society forms institutional barriers to the types of employment offered to them by firms. Hiring women increases the fixed costs of labour in the long run, so that women are primarily hired in casual, part-time jobs. Therefore, the reason why part-time jobs discourage female workers in the long run, is to be
found in the objectives of the firm’s hiring policies. The precariousness and ‘un-flexibility’ that characterise casual vacancies deter women’s opportunities to work and to be a parent.

2. Discussion

This study supports the argument of Song and Webster (2003) that the level of education does not facilitate the job matching process; it leads to consider the Keynesian models of unemployment, in that ‘too few jobs’ have been created in full-time permanent positions, leading to high demand for highly skilled (committed) workers, but also excess supply of highly-skilled labour in low commitment and flexible-hours jobs.

The major conclusion that can be drawn from this study is that while in the first ten years of the sample unemployment could have been accounted for by frictional and structural factors, the following years show a more complex institutional influence on employment. The new vacancies created have been matched primarily according to commitments and responsibilities of workers rather than skills.

In this paper, we argue that females in casual jobs is a result of labour market segregation in casual jobs rather than individual preferences, which leads to an increase in underemployment and underutilisation of the labour force, particularly for women. A recent study by Preston and Whitehouse (2004), suggests that the persistence in women’s occupational segregation is determined by factors such as regulation of the employment relationship, societal norms, government ideology, and a form of employer discrimination on the assumption that women have less commitment and lower work abilities.

Other studies of occupational segregation on the basis of gender differences (Preston and Whitehouse, 2004; Lee and Miller, 2004) revealed that in Australia this phenomenon has never changed, despite the legislative reforms introduced in the labour market. In this paper we find that part-time vacancies are in excess of what is demanded by the female labour force. Part-time vacancies do not encourage female employment, which is contrary to what is commonly believed.

This discrepancy calls for further investigation into the reasons why firms offer more part-time jobs than the expected ‘equilibrium-efficient’ number. It supports the hypothesis that occupational segregation by sex occurs everywhere (Anker, 1997), reflecting an unrecognised labour market rigidity based on social roles, disadvantaging women and, so perpetuating gender inequalities.

Therefore, the reason why the negative and stable long-term relationship between unemployment and vacancies has not changed is the firms’ commonly shared beliefs about the social role of women as being for family responsibilities. In terms of cost-minimizing hiring practices, women are perceived to increase the costs of labour in full-time permanent jobs. Segregation leads to an increase in underemployment and underutilisation of women.

Casual employment is a type of short-term or irregular job. In recent times, however, many women (and men) are employed as casuals on a long-term basis. In August 2004, 55 per cent of the 2.0 million casual employees in Australia had been with their employer for 12 months or more, compared with 83 per cent of the 5.7 million ongoing employees; but the proportion of women who are ongoing casual is persistently higher than that of men.
Casual employees are primarily employed in industries such as the accommodation, cafés and restaurants industry (59 per cent), retail trade (45 per cent), and cultural and recreational services (45 per cent). In these industries, women make up the majority of casual employees (ABS, cat. 1301.0, 2006). It is important to note that casual employees, particularly those who have been casual for an extended period, do not enjoy the same rights and entitlements as ongoing employees. Their working conditions involve low levels of training, poor career opportunities and adverse occupational health and safety outcomes (ABS, cat. 4102.0, 2005b).

In this paper we argue that the negative and stable long-term relationship between unemployment and vacancies suggests that part-time vacancies do not encourage female employment, which is contrary to what is commonly believed. It also suggests that this has always been the case because of the socially accepted belief that hiring women in full-time highly-paid permanent jobs increase their fixed costs of hiring; which reduces the firm’s long-term ability to benefit from their investments on labour.

3. Methodology

The most significant empirical studies of the Beveridge curve are the studies by Blanchard and Diamond (1989); Fahrer and Pease (1993); Layard, Nickell and Jackman (1991). They found that the Beveridge curve shifted outwards (i.e. deteriorated) in 1974, and further outwards during the 1980s, resulting in a higher level of unemployment for a given number of job vacancies than had previously been the case.

It was presumed that the possible causes of these shifts were to be partially offset by certain structural changes in the Australian labour force during that period, and by the lack of adjustment of wages in response to these shifts (Gross, 1993; Hughes, 1975; Harper, 1980; Withers and Pope, 1985; King, 1986; Webster, 1998). They argued for more flexibility and deregulation of the labour market in order to facilitate wage adjustments and increase information about the location of jobs. The estimates presented in this paper, however, reveal that the Beveridge curve deteriorates despite these labour market programs that facilitate the matching process.

The structural change of the 1980s and the 1990s, which deregulated the labour market, did not eradicate the belief about the expected social roles and family responsibilities of women. Their roles act as a disincentive for firms. Women’s roles, as being primarily responsible for family house work, are perceived as a factor increasing the fixed cost of hiring. Because firms choose cost-minimizing labour policies (unitarist HRM policies), rather than pluralist policies, they minimise these fixed costs, by hiring females primarily in casual part-time positions. Firms’ investments in human capital will therefore, deliver long term benefits.

In order to estimate the model, the decomposition of the unemployment and vacancy series into their trend and cyclical components, is undertaken by applying the HP filter technique. The advantage of this technique is that, by removing the trend component, the coefficients of the regression are estimated on the basis of the business cycle only, thus removing any distortionary effects contained in the trend component, which could occur as a result of fundamental long-term changes due to demand deficiency factors, for example, the significant increase in total unemployment from the mid-1970s onwards. For any time series data, the HP filter is obtained by applying a solution to the following optimisation problem.
min \sum_{t=1}^{T} (X_t - Z_t)^2 + \lambda \sum_{t=2}^{T-1} [(Z_{t+1} - Z_t) - (Z_t - Z_{t-1})]^2 \tag{1}

where \( X_t \) is the observed value of the series; \( Z_t \) is the trend component; \( X_t - Z_t \) is the cyclical component; and \( \lambda \) is the smoothing parameter, which, with the suggestion of Prescott (1986), is set to 1,600 for quarterly data. The specification of the HP filter as depicted in equation (1) derives a solution that produces a trend component whereby the squared deviations from the time series are minimised subject to a smoothness constraint, which is the sum of squares of the second difference. The basic static univariate model used can be represented by the following set of equations

\[ u_t^C = \beta v_t^C + \xi_t \tag{2} \]
\[ u_t^C = u_t - u_t^H \tag{3} \]
\[ v_t^C = v_t - v_t^H \tag{4} \]

where \( u_t \) is the logarithm (hence small case notation) of total unemployment observed at time \( t \), \( u_t^H \) is the corresponding HP filtered total unemployment, \( u_t^C \) is the ‘cyclical’ component of total unemployment, \( v_t \) is total job vacancies, \( v_t^H \) is the HP filtered total job vacancies, \( v_t^C \) is the cyclical component of total job vacancies, and \( \xi_t \) is a n.i.d \((0,\sigma^2)\) error term. The value of \( \beta \) in equation (2) therefore represents the sensitivity of job vacancies to unemployment over the business cycle.

The use of static equations such as (2) often leads to the presence of serial correlation and thus to misspecification. In order to overcome this problem, equation (2) can be adjusted to include a dynamic specification, as well as a constant term, to derive

\[ u_t^C = \alpha + \beta v_t^C + \gamma u_{t-1} + \varepsilon_t \tag{5} \]

Since in the long-run \( u_t^C = u_{t-1}^C \), the specification in equation (5) also allows calculation of the long-run ‘Beveridge coefficient’, obtained by substituting \( u_t^C \) for \( u_{t-1}^C \) in equation (5) and rearranging to derive the following

\[ u_t^C = \frac{\alpha}{1-\gamma} + \frac{\beta}{1-\gamma} v_t^C + \frac{\varepsilon_t}{1-\gamma} \tag{6} \]

where the long-run parameter of interest is given by

\[ \theta = \frac{\beta}{1-\gamma} \tag{7} \]

Within this framework, primary interest surrounds the values of \( \beta \) and \( \theta \) from (5) and (7), respectively, with the value of \( \beta \) representing the ‘short-run’ (3-months frequency) and \( \theta \),
the ‘long-run’ elasticity of vacancies to unemployment. The next section defines the term of ‘full-employment’ used in this study.

4. The Full-Employment Level of Unemployment

The definition of the term ‘full-employment’ used in this study is that in which the number of unemployed people in the workforce is equal to the number of job vacancies. Any unemployment existing in this state of full-employment is often classified as being due to either ‘frictional’ or ‘structural’ factors. We consider any unemployment in addition to the one existing in this state of full-employment; as being given by structural factors. Unemployment is therefore consistent with demand-deficient unemployment (King, 1986), but different from location and/or skills mismatch (non-demand deficient).

In Australia, the Beveridge curve shifted outwards in the 1970s, in the 1980s, and again in the mid-1990s. This meant that unemployment increased even in the presence of labour market expenditures and declining rates of unemployment, as the number of vacancies decreased in the same period. What is important to consider is that the Beveridge curve is not just a measure of how quickly new vacancies are matched by the unemployed, but also a measure that investigates the causes of unemployment. The hypothesis is that institutional factors (i.e. firm’s hiring practices) represent institutional barriers to employment, in-so-far that they increase the cost of hiring labour (demand-deficient).

This shift outward was also found in the mid-1990s even in the presence of labour market expenditures and declining rates of unemployment (Webster, 1998; Song and Webster, 2001). The 1980s and the recession of the early 1990s changed the organizational way of business production and, more generally, how the labour market institutions were structured⁴, and the vacancies created have been mostly casual. Therefore, new vacancies were matched quickly, but firms’ barriers to permanent employment for women were still in place.

These changes required flexibility in both the labour market and organizations. Labour market supply and demand of workers changed subsequently, at macro and micro levels (Burgess and Campbell, 1998)⁴. The supply and demand referred more to hours and skills per worker rather than just workers and hours. Therefore, we argue that the new ways of working were developed, such as job sharing, fixed-term work, and distancing (contractors), within collective EBAs (Enterprise Bargaining Agreements, 1992) and individual AWAs (Australian Workplace Agreements, 1996), that facilitated a different type of matching.

This process of deregulation and individualisation of the labour market, continued with a further fragmentation of workers’ wages and conditions in 1996, and again in 2005 with WorkChoices. By the late 1990s, this process of deregulation and decentralization brought about job precariousness, especially amongst women (ACIRRT, 1999; Wooden, 2000), long hours of work, unpaid overtime, and inequalities in earnings, especially between male and female workers (Boreham, Hall, Harley and Whitehouse, 1996; Preston, 2001; Campbell, 2002).

The Beveridge curve, therefore, is not merely a statistical tool to measure how quickly new vacancies are matched to the unemployed, but it also explains the causes of unemployment. The increase in aggregate demand of the mid-1990s, increased the need for firms to hire more labour in order to produce extra output. Job creation was therefore linked to a process of
deregulation and decentralisation. The process of hiring, increases the fixed costs of labour in the long-term (labour turnover), thereby affecting the firm’s long-term benefits from investing in human capital. Therefore, the vacancies created since then have been mostly low-cost hiring jobs that are casual jobs, which lead to the unwarranted outcome of increased job casualisation (rather than permanent jobs), where women were mainly employed. It is important to note that casual jobs, whether part-time or full-time, do not offer the same working entitlements and conditions of permanent jobs (full-time or part-time), and hence are a cost-minimising tool for firms.

The Australian Bureau of Statistics defines casual workers using the following definition: “a casual employee is defined as an employee who is not entitled to either paid holiday leave or paid sick leave in their main job, while an ongoing employee is an employee who is entitled to either paid holiday leave or paid sick leave (or both) in their main job” (ABS, cat. 1301, 2006). The amount of remuneration, the conditions of employment, and the amount of risk associated with this type of employment affects the workers’ sense of economic security and overall wellbeing. This is the reason why casuals’ jobs should be offered on a temporary basis.

Nevertheless, it is casual employment that has increased most rapidly in the last two decades in Australia. Most jobs created in the last two decades are casual, labour market productivity has increased steadily during the same period (Cavagnoli, 2008; Magnani and Prentice, 2006), and that job entitlements (fixed costs) have generally decreased (ABS cat. 6105.0 - 2008)⁵. It can be argued that deregulation has brought about a labour market segmentation based on the social expected responsibilities of labour, thereby segmenting jobs between (the firm’s) cost-minimising permanent and casual positions.

Jobs with or without standard entitlements affect the measurements of the fixed costs of labour, as well as peoples’ working conditions. Shimer (2005) argued that the standard analysis of unemployment fluctuations cannot account for major structural shocks that affect productivity and real wages. However, productivity and real wages are the variables that influence the number of jobs offered. He argued for an alternative view to the standard analysis of the Beveridge Curve. Nickell, Nunziata, Ochel and Quintini (2003) argued the Beveridge curve can only be partly explained by changes in labour market institutional changes for search and matching efficiency, as these changes also impact on labour costs. They find high levels of persistence in unemployment, which are endogenous to these institutional changes, and which affect labour costs.

Kennes (2004) found also that the vacancy/unemployment ratio can either overshoot or undershoot its steady state value in response to a change in the productivity of jobs rather than to policies to facilitate on-the-job search. Katz and Krueger (1999), investigated population changes as a main determinant of unemployment (i.e. more women in the labour force). They suggest that unemployment is unlikely to increase because of demographic increases, but demographic changes can bring about long-lasting shocks to innovation and industrial productivity, thereby boosting employment. Therefore, even though the quantity of workers increases, the natural reaction of the market economy is to innovate products and practices, thereby increasing productivity and market demand.

These findings indicate that, contrary to popular belief, the ‘price’ of labour is actually positively affected by the increased quantity of workers, given deregulation and flexibility, but negatively affected by long-standing practices of labour hiring and measurement of
labour costs. Yashiv (2006) found two important discrepancies in the search and matching model of unemployment. A convexity in hiring costs and a stochastic property of the separation rate (a worker and job are poorly matched; the worker remains in the labor force, and the result is both an additional vacancies and additional unemployment). That is the bargaining power of the parties, and the replacement ratio of labour, affect the costs of hiring and hence, the wage rate. A change in the price of labour (by the firms’ hiring practices) in turn affects the market clearing price and quantity of labour.

Valletta (2005) suggests that favorable labour market conditions created by labour market deregulation, brought about a decline in the dispersion of employment growth across geographic areas; this decline contributes to a downward shift of the Beveridge Curve. However, there are open questions about the types of jobs that labour market deregulation has created, and in turn, about the market clearing price of labour. In this paper, the ‘full-employment’ rate of unemployment is calculated in levels to match the changes of a fragmented (by job entitlements, and hence, labour costs) labour market. Following the estimation of $\theta$ from an equation whereby the variables are specified in logarithms (assuming that the long-run sensitivity of $u$ to $v$ is of interest), the formula that enables the full-employment rate of unemployment at $t$, $UR^F_t$ to be calculated is

$$ UR^F_t = \frac{U^F_t}{L_t} = \frac{e^{v_t-\theta(v_t-u_t)}}{L_t} $$

where $U^F_t$ is the corresponding level of total unemployment in the state of full employment, and $L_t$ is the corresponding total labour force. However, it is important to notice that this formula considers the long-term changes with a costless process of matching. Future research will require an extension of the formula to account for a not-yet acknowledged cost of matching as ‘extra’ hiring costs. In the meantime some interesting facts can still be uncovered.

5. Results

The $u_t$ and $v_t$ variables are the logarithms of total unemployment and total job vacancies respectively at time $t$ for Australia (measured in thousands of people), where unemployment and vacancies are as defined by the ABS. These series are seasonally adjusted and broken down according to sex and work-hours status to analyze the male-female differences in unemployment (see Table 1). The quarterly sample is drawn from the sample with 105 quarterly observations extending from 1979Q2-2005Q2, which is a period of transition from high unemployment and (relatively) low vacancies to the lowest level of unemployment recorded in Australia since the early 1960s. From this full sample the sub-period 1983Q2 is considered, simply because of data availability.

The cyclical components resulting from applying the HP filter are displayed. The relation between total unemployment and total vacancies is clearly inverse for both the full- and sub-period. From the line-of-best-fit displayed on a scatter graph, it can also be seen that while for males, unemployment follows the expected pattern, this is not the case for female unemployment (see figures 1 and 2). There is an important unexpected difference in patterns with part-time vacancies.
These results are consistent with those of the sub-sample for part-time unemployment. There seems to be an almost increasing quadratic trend (see Table 2). Once again, this evidence suggests that there is an important relationship between the socially accepted gender roles and their joint employment offers, which needs to be considered when analyzing female unemployment rates. The participation in the labour force by women has increased sharply since the 1980s. It was especially larger for married women. This increase was matched by a parallel increase in casual, part-time jobs. These jobs are low paid and low cost; hence, the increase in female labour force participation is associated with an increase in low paid, low cost jobs. There is evidence that labour market segregation by gender and discrimination can be perpetuated via flexible work agreements.

In testing for coefficient values and conventional $t$-statistics for equation (5), the following measures of regression fit are reported: the unadjusted coefficient of determination, $R^2$ and the standard error of the equation, $SER$. In addition to these results, the diagnostic tests (as well as their probabilities) used are as follows: the Breusch and Godfrey (1981) test for first-order serial correlation in $\varepsilon_t$, which follows an $F$-distribution, $SC$; the Ramsey (1970) RESET test for functional form, also follow an $F$-distribution, $FF$; and the Jarque and Bera (1980) test for normality of $\varepsilon_t$, $NO$ distributed as $\chi^2(2)$. Finally, the White (1980) test for heteroscedasticity in $\varepsilon_t$, following an $F$-distribution, $HE$, is repeated.

The results of a full-sample OLS test of equation (5) show that $\beta$ and $\theta$ are both significantly negative, thus supporting the stylised fact that the Beveridge curve is indeed negatively sloped. With respect to the interpretation of the parameter estimates, when the economy heads into (or is in) recession, a 1 per cent fall in job vacancies is associated with a rise of approximately 0.17 per cent in the level of unemployment within a quarter, and an overall increase in the level of unemployment of approximately 0.61 per cent in the long-run, *mutatis mutandis* for the case of heading into (or being in) a boom (see Table 1).

The estimate of $\beta$ represents the sensitivity of changes in vacancies to unemployment in the short run. For example, a 1 per cent fall in full-time vacancies is associated with a rise of 0.19 per cent in the level of male unemployment within a quarter, while for females the increase is analogous, at 0.15 per cent. Overall, the increase in the level of unemployment in the long term ($\theta$) is 0.66 per cent for men and 0.40 per cent for women. In terms of changes in part-time vacancies, a 1 per cent fall increases male unemployment by 0.13 per cent in the short run; while it increases unemployment for women by 0.05 per cent. If we consider the long run effect of a 1 per cent fall in part-time vacancies, unemployment for men increases by 0.15 per cent, but for women it increases only by 0.07 per cent (see Table 2).

These estimates tell us that there is no difference in the relationship between unemployment and full-time and part-time vacancies for males, either in terms of sensitivity or long term change. However, unemployment is far less responsive for women than for men in the long run (about half). In the short run, the coefficient of sensitivity is just above the rate of responsiveness; however, the dynamic estimate is smaller for women; this means that that the change is faster while proceeding to the long run.

Overall these results tell us that levels of $\beta$, $\gamma$, and $\theta$ for part-time vacancies are much lower than those for full-time. This means that unemployment is not very responsive to vacancies in part-time jobs; and this is a surprising result, especially for women, as they are generally believed to prefer part-time over full-time work, to balance their work and family
responsibilities. To explain this discrepancy, we propose that there needs to be a distinction between permanent and casual vacancies. If a distinction is made, then the evidence shows that casual part-time jobs also discourage women in the long run.

From 1980 to 2004, Australia experienced a 51 per cent growth in employment, mostly in the service sector; 38 per cent of this share was in part-time jobs, but 69 percent of the growth was casual employment (ABS, cat. 1370, 2004). By 2004 in Australia, 45 per cent of women, compared to 15 per cent of men, were employed in part-time jobs (ABS, cat. 6202, 2004b). In total, 58 per cent of those part-time jobs are matched by women employed as casuals (ABS, cat. 4102, 2005b).7

This paper supports Pocock and Masterman-Smith’s (2005) argument that casual part-time jobs discourage workers, especially women, in the long run, as these jobs cannot offer an equal bargaining power in the employment negotiation between employers and employees. These jobs do not assist employees in their work/family balance. The empirical findings in this paper show that part-time work does not change women unemployment or underemployment status in the long run; and because vacancies are offered primarily in casual work, the female Beveridge curve reflects a persistence of gender occupational segregation by gender-role stereotypes within society, which is detrimental to women’s status, income and welfare.

The females’ estimates on working hours are lower then those of men, both horizontally and vertically, for both full- and part-time vacancies; and, for females, the coefficient for part-time vacancies is insignificant. We argue that occupational segregation by sex affects female-male pay differentials; specifically, it increases the difference (see Table 2).

Women’s labour force participation comprises about 45 per cent of the labour force (ABS, cat. 6105, 2007). However, they continue to be employed in lower paid and less secure jobs than men (ABS, cat. 4102, 2005b). Evans and Kelley (2004) suggest that education is a great influence on women’s labour market participation and on their hours of work. However, since 1993 females with a bachelors degree or higher increased from 9.4 per cent to 19 per cent of the labour force, whereas it was 11.5 per cent to 17 per cent for males in the same period. In the same period 81 per cent of all persons with non-school qualifications were employed, 77 per cent on a full-time basis. Moreover, the proportion of employed women working on a permanent and full-time basis has continued to decline (AUSTAT, 2005; ABS, cat. 4102, 2003).8 Nevertheless the lowest proportions of casual employees were found in the highest skilled occupation groups: managers and administrators (6 per cent), professionals (12 per cent) and associate professionals (13 per cent), where men are mainly employed (ABS, cat. 1301.0, 2006).

Considering that the majority of jobs created in the last two decades have been casual and that there has been a constant increase in education, women’s occupational choices in low paid jobs seem to be the result of institutional barriers rather than the result of their preferences. The evidence found in this paper does not support either the theory of human capital and work and family balance (Becker, 1975 and 1991), or the human agency theory of employment as a legitimate product of women’s choice (Hakim, 2000).

The breakdown of the estimates in table 3 according to states does not seem to reveal any important results, and the estimates for the coefficients according to industry show that everything is insignificant (see Table 4). Only in health and community services,
manufacturing, transport and storage are $\beta$ and $\theta$ significant. However, these results seem counter-intuitive. The estimates for $\beta$ and $\theta$ are insignificant in industries that experienced rapid productivity growth (from 1992 to 2003) and steady employment growth (from the 1980s); however, the types of jobs created, especially for women, are part-time and casual. These are the reasons why we argue that unemployment and vacancy measurements must include components, such as the types of paid work arrangements offered.

This discrepancy further reinforces the argument that deregulation and firm’s cost-minimizing hiring policies, create excess vacancies in casual jobs, which effect unemployment in terms of increasing the rate of underemployed and underutilised labour. It is this ‘excess’ of unemployment that labour market policies should be specifically aimed at reducing. To the authors’ knowledge, empirical studies of the Beveridge curve trying to include the types of paid work arrangements have not been undertaken.

6. Conclusion

The Beveridge curve is an important tool in labour economics. It reflects the state of the labour market, the effectiveness of the job searching, finding and matching processes, as well as the transition between employment and unemployment. The main findings in this paper are that full-time vacancies are matched more easily with male workers, and that a change in the number of vacancies makes a substantial difference to male long-term unemployment. However, this is not the case for women, especially if part-time vacancies are considered.

What is of interest is that the constant negative relationship reveals a persistent employment of women of women in low paid jobs as constantly higher than that of men, which is not given by skills or location mismatch; but nevertheless discourage them in the long term. The labour market is segregated by gender differences, in terms of workers’ expected social roles and responsibilities.

This paper supports the hypothesis for the existence of two Beveridge curves for males and females; and highlights the surprisingly ineffective role played by part-time vacancies in reversing this distinction. These vacancies are unable to reduce female unemployment in the long run, yet they are detrimental to women’s status and welfare in the long run. Therefore, this paper argues that equilibrium unemployment is demand-deficient; but the structural components of unemployment need to include the occupational imbalances in the demand and in the supply of labour, which are not due to skills and/or location mismatch; but rather to the type of vacancies created and the types of job arrangements offered.
Endnotes

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1. This smoothness constraint is weighted by the $\lambda$ parameter, which must take a positive real value. As its value increases, variability in the trend component is ‘penalised’ more, and the trend component becomes smoother. Given the properties of the time series data used in this study, the HP filter with a value of $\lambda = 1,600$ allows for an empirically effective decomposition of the series.

2. Friedrich et al. (1998, p. 506) argued that “due to the costs, organizations have to decide for what types of jobs it will be efficient to increase the labour skills and in what way other personal management practices should support such investment in human capital...”.

3. Mass production (semi-skilled workers) was given up for more specialised and high quality production and firms required more high skilled and very motivated workers, as well as more participation in managerial activities (Bray et al., 2004, p. 159).

4. At the macro level, the deregulation of the industrial relations system meant decentralization of power and authority over labour contracts; and therefore over rights, entitlements, and the fixed costs of labour. Various tribunal decisions and legislative changes in the late 1980s and early 1990s shifted control over the regulation of employees’ entitlements from Federal decisions to Collective decisions at the Enterprise level (Enterprise Bargaining Act, 1991), down to individual decisions (employer-employee) and Agreements (Australian Workplace Agreements, 1996). AWAs, however, tend to be mass-produced agreements, by employers. They cannot be considered bilateral agreements. This fact has important implications for equal bargaining power of the parties, and hence, for equal share of labour inputs to produced output. At the micro level, flexibility and deregulation meant fewer disputes and less rigidities within the workplace, over decisions for working hours, training, career opportunities, and rewards. Flexibility in particular meant a more ‘understanding’ approach for management policies (the take-off of Human Resource Management). However, this process of deregulation was matched with a lack of uniform laws and regulations for minimum standards of employments.

5. The proportion of employees without paid leave entitlements has been increasing since the early 1990s (ABS cat. 6105.0, 2007, 2008; ABS cat. 6310.0, 2007).

6. Labour force data are also required for the purposes of working out $UR_t$ and $UR_t^F$. 
7. To better interpret the gender differences in employment is important also to point out that the definition of casual employee includes employees who operate their own ‘incorporated enterprise’ with or without hiring employees (ABS, cat. 1370, 2004). These are self-employed workers, or contractors, and they are primarily males. In addition to the fact that there are very different responsibilities of the firm associated with each type of employment, the outcome is that the proportion of women employed in casual low-paid jobs is constantly higher than that of men.

8. Song and Webster (2001) tested the hypothesis of separate Beveridge curves according to skilled and unskilled workers. Their paper supports this hypothesis. Vacancy durations were found longer for skilled than unskilled labour, which resulted in an unstable rather than a clear negative relationship between unemployment and vacancies since the 1990s.

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Figure 1. Unemployment and Vacancy Data by Sex and Work-Hours Status (Observed Series and HP Trend)
Figure 2. Cyclical Components of Unemployment by Type (Solid Line) and Vacancies (Dashed Line)
Figure 3. Cyclical Components of Unemployment and Vacancies (Scatter Graph)

Table 1. Aggregate Results by Sex and Work-Hours Status

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>Male</th>
<th>Female</th>
<th>Full-Time</th>
<th>Part-Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\alpha$</td>
<td>-0.0009</td>
<td>-0.0001</td>
<td>-0.0003</td>
<td>-0.0001</td>
<td>0.0002</td>
</tr>
<tr>
<td></td>
<td>(0.0036)</td>
<td>(0.0034)</td>
<td>(0.0039)</td>
<td>(0.0032)</td>
<td>(0.0056)</td>
</tr>
<tr>
<td>$\beta$</td>
<td>-0.1676*</td>
<td>-0.1807*</td>
<td>-0.1266*</td>
<td>-0.1669*</td>
<td>-0.0808*</td>
</tr>
<tr>
<td></td>
<td>(0.0245)</td>
<td>(0.0252)</td>
<td>(0.0254)</td>
<td>(0.0229)</td>
<td>(0.0326)</td>
</tr>
<tr>
<td>$\gamma$</td>
<td>0.7263*</td>
<td>0.7408*</td>
<td>0.5980*</td>
<td>0.7200*</td>
<td>0.1703</td>
</tr>
<tr>
<td></td>
<td>(0.0435)</td>
<td>(0.0450)</td>
<td>(0.0700)</td>
<td>(0.0431)</td>
<td>(0.1055)</td>
</tr>
<tr>
<td>$\theta$</td>
<td>-0.6124*</td>
<td>-0.6120*</td>
<td>-0.3151*</td>
<td>-0.5960*</td>
<td>-0.0974*</td>
</tr>
<tr>
<td></td>
<td>(0.0875)</td>
<td>(0.0754)</td>
<td>(0.0592)</td>
<td>(0.0761)</td>
<td>(0.0381)</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.87</td>
<td>0.90</td>
<td>0.69</td>
<td>0.90</td>
<td>0.12</td>
</tr>
<tr>
<td>SER</td>
<td>0.0370</td>
<td>0.0317</td>
<td>0.0362</td>
<td>0.0297</td>
<td>0.0521</td>
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<tr>
<td>SC</td>
<td>2.32</td>
<td>2.48</td>
<td>2.47</td>
<td>2.31</td>
<td>1.39</td>
</tr>
<tr>
<td>FF</td>
<td>1.68</td>
<td>4.43</td>
<td>1.83</td>
<td>3.41</td>
<td>0.81</td>
</tr>
<tr>
<td>NO</td>
<td>39.18*</td>
<td>1.85</td>
<td>1.75</td>
<td>0.84</td>
<td>1.25</td>
</tr>
<tr>
<td>HE</td>
<td>0.12</td>
<td>3.59</td>
<td>0.34</td>
<td>5.12*</td>
<td>0.26</td>
</tr>
</tbody>
</table>

*Significant at the five per cent level.
Table 2. Discouragement Estimates by Sex and Work-Hours Status

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<tr>
<th></th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$\beta$</td>
<td>$\theta$</td>
</tr>
<tr>
<td>Full-Time</td>
<td>-0.1922*</td>
<td>-0.1536*</td>
</tr>
<tr>
<td></td>
<td>-0.6602*</td>
<td>-0.4002*</td>
</tr>
<tr>
<td>Part-Time</td>
<td>-0.1375*</td>
<td>-0.0528</td>
</tr>
<tr>
<td></td>
<td>-0.1508*</td>
<td>-0.0732</td>
</tr>
</tbody>
</table>

*Significant at the five per cent level.

Table 3. Coefficient Estimates by State

<table>
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<th>$\theta$</th>
<th>$R^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>New South Wales</td>
<td>-0.1212*</td>
<td>-0.3500*</td>
<td>0.72</td>
</tr>
<tr>
<td>Victoria</td>
<td>-0.1167*</td>
<td>-0.4027*</td>
<td>0.76</td>
</tr>
<tr>
<td>Queensland</td>
<td>-0.0840*</td>
<td>-0.2707*</td>
<td>0.66</td>
</tr>
<tr>
<td>South Australia</td>
<td>-0.0250</td>
<td>-0.0962</td>
<td>0.58</td>
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<tr>
<td>Western Australia</td>
<td>-0.0422*</td>
<td>-0.1868*</td>
<td>0.70</td>
</tr>
<tr>
<td>Tasmania</td>
<td>-0.0282</td>
<td>-0.0445</td>
<td>0.16</td>
</tr>
<tr>
<td>Australian Capital Territory</td>
<td>-0.1327*</td>
<td>-0.1886*</td>
<td>0.25</td>
</tr>
<tr>
<td>Northern Territory</td>
<td>-0.1543*</td>
<td>-0.2276*</td>
<td>0.18</td>
</tr>
</tbody>
</table>

*Significant at the five per cent level.

Table 4. Estimates by Industry

<table>
<thead>
<tr>
<th></th>
<th>$\beta$</th>
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</thead>
<tbody>
<tr>
<td>Accommodation, Cafes and Restaurants</td>
<td>-0.0169</td>
<td>-0.0769</td>
</tr>
<tr>
<td>Communications Services</td>
<td>-0.0082</td>
<td>-0.0310</td>
</tr>
<tr>
<td>Cultural and Recreation Services</td>
<td>-0.0019</td>
<td>-0.0087</td>
</tr>
<tr>
<td>Construction</td>
<td>-0.0118</td>
<td>-0.0700</td>
</tr>
<tr>
<td>Education</td>
<td>-0.0267</td>
<td>-0.0994</td>
</tr>
<tr>
<td>Energy, Gas and Water</td>
<td>-0.0141</td>
<td>-0.0661</td>
</tr>
<tr>
<td>Finance and Insurance</td>
<td>0.0052</td>
<td>0.0262</td>
</tr>
<tr>
<td>Government Administration and Defence</td>
<td>-0.0390</td>
<td>-0.1590</td>
</tr>
<tr>
<td>Health and Community Services</td>
<td>-0.0675*</td>
<td>-0.2637*</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>-0.0677*</td>
<td>-0.1806*</td>
</tr>
<tr>
<td>Mining</td>
<td>0.0022</td>
<td>0.0103</td>
</tr>
<tr>
<td>Property and Business Services</td>
<td>-0.0060</td>
<td>-0.0273</td>
</tr>
<tr>
<td>Personal and Other Services</td>
<td>0.0013</td>
<td>0.0063</td>
</tr>
<tr>
<td>Retail Trade</td>
<td>-0.0294</td>
<td>-0.1127</td>
</tr>
<tr>
<td>Transport and Storage</td>
<td>-0.0208*</td>
<td>-0.0708*</td>
</tr>
<tr>
<td>Wholesale Trade</td>
<td>-0.0268</td>
<td>-0.1098</td>
</tr>
</tbody>
</table>

*Significant at the five per cent level.