THE INSIDER-OUTSIDER THEORY: SOME EVIDENCE FROM AUSTRALIA

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ABSTRACT

This paper uses Australian micro data to test the insider-outsider model. As part of this, the paper also examines whether the distinction between insiders and outsiders has more relevance for males or females. The paper finds that males have more insider power than females. It is also argued that this represents an indirect test in support of Lindbeck and Snowers's (1988) turnover cost version of the theory. The paper pays particular attention to specification and estimation problems associated with the research.

Keywords: Insiders, outsiders, long-term unemployment.

JEL classifications: J3, J4, J6

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1. Introduction

Insider-outsider models have been advanced in recent years to explain a range of phenomena, principally the persistence of unemployment. This paper provides an empirical test of this theory using Australian microeconomic data. The work reported here can be seen as a contribution to the growing body of international evidence on the topic. Moreover, to the best of my knowledge, it represents the only attempt to test this theory with Australian microeconomic data.

The paper is organised as follows. Section 2 provides a brief overview of the insider-outsider theory. Section 3 outlines the methodology and data employed in the analysis. It also describes the key variables used, and discusses some important issues to do with specification and estimation. The results of the empirical analysis are outlined in Section 4. Section 5 contains some concluding remarks.

2. Theory

All insider-outsider models share in common the idea that insiders are highly insulated from competition by outsiders in wage setting. Insiders are usually employed workers; outsiders are usually the unemployed. The main implication of this is that wage outcomes, particularly in the aftermath of negative employment shocks, may prevent a rapid return to the pre-shock employment level. Three broad approaches can be identified in the literature.

The first approach is most commonly associated with the names of Blanchard and Summers (1986, 1987). In this approach the ability of insiders to ignore outsiders in wage setting is simply assumed. This approach is best seen as an extension of the microeconomic trade union literature. In that literature the indifference curves of the union are negatively sloped in real wage employment space. In the union literature, employed and unemployed union members have equal status. The main innovation in the Blanchard and Summers model is to assume that unemployed union members lose membership of the union (the insider group), and become outsiders.

This emphasis on 'membership rules' creates the possibility of persistence in unemployment. This is so since unanticipated shocks, which cause a change in actual employment, will then alter the size of the insider group in whose interest wages will be set in the next bargaining round. Unanticipated contractions in employment tend to generate upward wage movements, since any future level of labour demand has to be divided between a smaller, and as such more secure, insider group. Of course this wage behaviour tends to make the original contraction in employment persistent. The basic Blanchard and Summers model incorporates what could be called an ‘extreme’ membership rule. Under this rule insider status is lost as soon as an insider becomes unemployed. This extreme membership rule is

one of several strong assumptions required to generate hysteresis, the most severe form of persistence.[1]

The second approach is associated with the work of Lindbeck and Snower (1988, 2001). This approach is also capable, under the right assumptions, of generating the predictions of the Blanchard and Summers model. The major contribution of Lindbeck and Snower is to explain the source of insider power, rather than simply assuming it. They argue that insider power comes from a range of turnover costs. These costs mean that the firm's incumbent workforce cannot be costlessly exchanged for unemployed outsiders. These costs include hiring, training and firing costs. Firing costs include direct costs such as severance pay, but may also include more amorphous considerations, such as the negative morale impact of turnover on remaining employees. These turnover costs create a rent to be bargained over, and therefore, the possibility of wage outcomes that make it unprofitable for employers to employ outsiders. Models combining turnover costs and membership rules can explain unemployment persistence.

Lindbeck and Snower also explore asymmetric membership rules in which insider status is acquired and lost at different rates. The short-term unemployed for instance, may retain insider status. The newly employed can be assumed to require several periods of continuous employment before they are considered insiders. Varying these membership rules can produce interesting modifications to the predictions of the basic model.

The final approach is associated with Layard et al (1991), and identifies the long-term unemployed as outsiders. There are several strands to this 'outsider ineffectiveness hypothesis'. Long-term unemployment could result in skill atrophy, and or, demoralisation. Either or both of these will diminish the ability of the long-term unemployed to compete in the labour market. In addition employers may use unemployment duration as a screening mechanism. Under this scenario employers interpret long-term unemployment as a signal that a potential employee has already been found wanting. All these strands of thought lead to the conclusion that the long-term unemployed have little, or no, impact on wage outcomes.

Under these conditions past employment shocks could have a persistent impact on unemployment. This is so since the actual history of shocks to employment determines, in part, the current duration composition of unemployment, and hence the number of long-term unemployed in any given pool of unemployment. The larger the proportion of total unemployment that is long-term, all other things being equal, the more favourable are wage setting conditions for insiders. This may in turn generate wage outcomes that are inimical to future employment growth, thereby making the effect of past shocks persistent. See Layard et al (1991) for more on this approach.

[1] See Dobbie (2003, Chapter 2) for a detailed discussion of the meaning and implication of hysteresis and persistence as used in this literature.

3. Data, Methodology, Variable Descriptions, Specification and Estimation Issues

Data

This study uses data from two sources. The first data source is the 1995 Australian Workplace Industrial Relations Survey (AWIRS). The second data source is unpublished Labour Force Survey data provided by the Australian Bureau of Statistics. The AWIRS data are described and summarised in Morehead et al (1997). The primary task of AWIRS was '…to provide a comprehensive and statistically reliable database on workplace relations in Australia.' (Morehead et al, 1997, p1).

Workplaces from the Defence industry, as well as those from the Agriculture, Forestry and Fishing industry are not included in the survey. In addition, workplaces with less than five employees were excluded from the survey. AWIRS 1995 also contained a small workplace survey that collected information on workplace characteristics for workplaces with between 5-19 employees. However, no information on employees at these small workplaces was collected. As such these workplaces have been ignored in the analysis conducted in this paper.

AWIRS 1995 is rich in information about the characteristics of the sampled workplaces and their employees. This information enables detailed modeling of each employee's human capital and demographic characteristics.

Survey data are subject to some well-known limitations. Dobbie (2003, pp123-125) provides a detailed discussion of these, and how they impact on this study. It is argued there that careful choice of the variables employed in this study has reduced to a minimum any negatives associated with survey data.

As discussed below, various unemployment measures are used in this study to capture insider-outsider influences. These variables are constructed from unpublished Labour Force Survey data, provided by the Australian Bureau of Statistics. These data are used to construct a total unemployment rate, a short-term unemployment rate, and a long-term unemployment proportion for each state and territory cross-referenced on a metropolitan/non-metropolitan basis.[2] These unemployment variables are presented in Appendix 1.

[2] There is no metropolitan/non-metropolitan split for the Australian Capital Territory and the Northern Territory.

Methodology

The empirical analysis is conducted by estimating a cross-section log wage equation that includes insider-outsider proxy variables among the regressors. The equation estimated has the following form:

$$lnW_{ij}=\beta+X_{ij}\beta_1+Z_j\beta_2+\varepsilon_{ij} \qquad (1)$$

$$i=1,\ldots\ldots,N_j \qquad j=1,\ldots\ldots,J$$

Where

W_{ij} = the wage of worker i at workplace j.

X_{ij} = a set of employee specific human capital and job characteristics. These include the following; potential experience, tenure at current workplace, whether the employee is from a non-English speaking home, whether the employee is disabled, occupation, education, whether the employee is casual, whether the employee is on a fixed term contract. These variables are fully defined in Appendix 3 under the heading 'Individual Variables'.

Z_j = a set of variables describing the workplace at which each individual is employed. The variables include the following; workplace size, union density, occupational composition of the workplace, industry, the degree of product market competition faced by the workplace, whether the workplace operates primarily in export markets, whether the workplace faces competition from imported goods, percentage of the workplace workforce that is female, a measure of labour intensity, whether the workplace is foreign or Australian owned. All these variables are fully defined in Appendix 3 under the heading 'Workplace Variables'. Also included in this vector are the insider-outsider proxy variables. These variables are discussed in the next section, and are also fully described in Appendix 3 under the heading 'Insider-Outsider Variables'.

ε_{ij} = a disturbance term.

N_j is the number of observations for workplace j, and J is the number of workplaces.

The wage equation is estimated separately for males and females. This is a common practice in the estimation of union wage mark-ups. In addition, estimating separate equations for males and females allows for an indirect test of the turnover cost version of the theory. On average females have lower labour force attachment than males, and as such, less on the job training and experience.[3] It is therefore expected that turnover costs associated with female employees will be lower than for males. Lower turnover costs should be associated with less insider power, all other things being equal.

[3] This is evident from an examination of the summary statistics in Appendix 3. In the data used in this study males have an average of 20 years experience, while females have 16 years.

Descriptions of key variables

The dependent variable is the log hourly wage. The first outsider variable used in the analysis is the total unemployment rate in the region in which each worker is employed. If the unemployed are outsiders, then variation in the total unemployment rate will not have a statistically significant impact on log hourly wages. The first specification employed to test the insider-outsider model in this analysis, involves adding the total unemployment rate to the vector of workplace characteristics, Z_j.

Rather than all unemployed workers being outsiders, it is likely that there exists a continuum, representing 'degrees of outsiderness'. The degree of outsiderness would be based on unemployment duration (Lindbeck and Snower, 1988, p253-254). Flatau et al (1990), Flatau et al (1991) and Kenyon (1990) use this idea to test the insider-outsider distinction using Australian aggregate data. This study also uses this idea by including the proportion of total unemployment that is long-term as an outsider variable.[4]

If the long-term unemployed are outsiders, it is expected that a significant and positive relationship between insider wage outcomes and the proportion of total unemployment that is long-term should exist. It is also expected that the inclusion of a variable to control for the long-term unemployed proportion might result in the coefficient on the total unemployment rate taking a negative sign and becoming statistically significant. The second specification employed to test the insider-outsider model therefore involves adding the total unemployment rate, and the long-term unemployment proportion, to the vector of workplace characteristics, Z_j, in the wage equation.

A third specification is employed in the analysis to test an alternative formulation of the duration of unemployment, and or, membership rules approach. In some versions of the insider-outsider model, insider status is not lost the instant a worker becomes unemployed. Rather it is assumed that an insider needs to be unemployed for a period of time before he or she becomes an outsider. Under this scenario it might be reasonable to assume that the short-term unemployed may remain attached to the insider group, while only those with longer unemployment durations are ignored in wage setting.

Alternatively, the short-term unemployed may not belong to the insider group as such. However, they may be actual, or perceived, substitutes for employed insiders. This could be the case if the short-term unemployed retain labour market contacts and skills, which longer durations of unemployment tend to erode. On either account, an increase (decrease) in the short-term unemployment rate may induce employed insiders to decrease (increase) wage demands. The third specification employed in the analysis undertaken here involves the inclusion of a variable in Z_j to represent the short-term unemployed.[5]

[4] The long-term unemployed have experienced 52 weeks or more of continuous unemployment.
[5] The short-term unemployed have been unemployed for 13 weeks or less.

Two potentially important limitations of these unemployment variables should be noted. First, under the membership rules version of the insider-outsider model, it is implied that the short-term unemployed may be insiders because they have recently been part of the insider group i.e. recently employed. In reality most of the short-term unemployed have not been recently employed, but have come from outside the labour force. There is little that can be done about this except to acknowledge that it introduces the possibility of measurement error into the estimations.

On the other hand, the duration of unemployment based insider-outsider model is not subject to this limitation. In this version the short-term unemployed are insiders, not because they have recently been employed, but because they have not been unemployed for long. How they managed to arrive at this state of short-term unemployment (i.e. from employment or from outside the unemployment pool) is not relevant.

Secondly, the AWIRS data employed in this study only enable the location of workplaces to be identified by state and territory cross-referenced on metropolitan non-metropolitan basis. This means that the size and nature of these regional dimensions is potentially problematic since the impact of unemployment on wages will be constrained to be the same for workers in geographically distinct regions such as Cape York and South West Queensland. The result of this is the potential introduction of measurement error, which could bias upwards the standard errors. Apart from acknowledging the potential problem, there is little that can be done about this. It is a problem imposed by the nature of the data set.[6]

Each specification outlined above also includes an insider proxy variable that is drawn from the AWIRS 1995 data. This variable, called 'employment change', is a dummy variable equal to one if employment change at the workplace in the proceeding twelve months was positive, it equals zero if employment change was zero or negative. This variable implies a strict membership rule whereby the insider group at a workplace consists solely of incumbent employees. It implies that, unlike the case in which the short-term unemployed retain insider status, insider status is lost as soon as an insider becomes unemployed. If this strict membership rule holds the coefficient on 'employment change' should be significant and negative. As already noted such a strict membership rule is employed by Blanchard and Summers (1986, 1987), and is one assumption required for hysteresis.

As noted previously, each regression also contains a large number of control variables. These variables control for a range of individual employee and workplace characteristics. They are, by and large, standard inclusions in wage equations of the kind estimated in this study. Dobbie (2003, pp132-140) provides a detailed discussion of these variables, including the reasons for their inclusion as regressors. Appendix 3 includes a description of these variables. For efficiency of exposition these control variables are not reported in

[6] I am grateful to Bruce Chapman for pointing out both of these limitations in relation to the unemployment variables employed in this study.

this paper. The estimates in relation to these variables are generally as expected. Full results are available from the author upon request.

Estimation Procedures

The manner in which the workplace and employee surveys were obtained has implications for the estimation procedures used in this research. The procedure followed by those undertaking the survey was to take a random sample of workplaces from the population of workplaces. Having done this, a sample of employees from those workplaces was then obtained. In other words, the sample of employees was not drawn at random from the population of employees.

A group of individuals from the same workplace are likely to have characteristics that are more similar, than a group of individuals sampled from the population at large. This could result from any of a number of factors. Workers from a given workplace, for instance, could share a slightly unique 'workplace culture' which impacts on their productivity. Many of these common characteristics are unlikely to be measurable, and hence controlled for. As a result they will be registered in the error term with the result that there will be a correlation in the errors. This violation of the assumption that the errors are independently distributed implies that OLS may not be the appropriate estimation procedure. Greene (1991) shows that, under the circumstances just described, the error structure is given as follows:

$$\varepsilon_{ij}=\mu_{ij}+\lambda_j \qquad (2)$$

$$i=1,\ldots,N_j \qquad j=1,\ldots..,J$$

This error term has two components. The first component μ_{ij} varies independently across individuals both within and across workplaces. The second component λ_j varies across workplaces but is constant for workers within the same workplace (Wooden, 2001). This error structure corresponds to the random effects model and the efficient estimator is feasible Generalised Least Squares (Greene, 1991, p485ff).

An examination of residual plots, and the Breusch-Pagan-Godfrey test (neither reported in this paper) indicate that heteroscedasticity is a problem in the results. This was expected given that much of the data in AWIRS 1995 are grouped. The presence of heteroscedasticity means that the standard errors from the random effects regressions are not efficient. An estimator using a procedure such as White's (1980) is not available for the random effects model. In an attempt to compensate for this, OLS regressions with the t-ratios corrected using White's (1980) procedure are also estimated and reported. If the results from the OLS and random effects regressions are qualitatively similar, the conclusion is drawn that the econometric difficulties just discussed are not of practical importance. The results suggest that this is the case. The OLS and random effects estimates, reported in Tables 1 and 2 below are quantitatively and qualitatively very

similar. It is acknowledged that this discussion of the random effects model, the problem of heteroscedasticity and the decision to estimate OLS regressions using White's (1980) procedure follows Wooden (2001) and Wooden and Bora (1999).

Measurement error also results from the fact that the employee earnings variable reported in AWIRS 1995 is grouped into 23 categories. The usual practice of allocating midpoints to each earnings category has been followed in this research. The top and bottom pay categories are open-ended. They have been closed somewhat arbitrarily. Sensitivity tests show that the findings are not sensitive to the end points chosen.

The work of Moulton (1986) highlights another potential problem with the estimation of equation (1). This problem relates to the fact that the regressions include regional unemployment measures as explanatory variables. These explanatory variables are defined at a higher level of aggregation than the dependent variable. Moulton has shown that in this situation the t statistics may be biased upwards. In the earnings equations estimated in this paper, this will occur where the earnings of workers in the same region share some common component of variation that cannot be completely explained either in terms of measurable characteristics or the rate of unemployment. In this case there will be a positive correlation in the error term for workers in the same region (Kennedy and Borland, 2000, p784).

One way in which this problem can be overcome is to estimate a 'cell means' regression. In this estimation the dependent variable and all of the independent variables are defined as the average values for some common level of aggregation, e.g. in the current application the average for each of the 14 regions. On the assumption that unobserved determinants of individual earnings are uncorrelated across the regions this approach should generate unbiased estimates of the standard errors. Unfortunately this approach cannot be used in this research since the number of explanatory variables is larger than the number of regional cells (Kennedy and Borland, 2000, p785).

Refining the Sample and Dealing with Missing Observations

The original sample consisted of 19155 employees and 2001 workplaces. Dobbie (2003, pp125-127) provides a detailed discussion of how the final sample of workplaces and employees used in this study was arrived at. In brief, all non-commercial and Public Sector workplaces and employees were eliminated from the sample. This was done in the belief that the insider-outsider model is not meant to apply to these workers and workplaces. This decision cost one third of the sample. In the case of some of the variables used in the study, 'missing' or 'no response' rates where as high as 50%. Once all cases with missing observations are eliminated, the sample used in the analysis consists of 4001 employees (1507 females and 2494 males) spread across 444 workplaces. This large loss of observations could raise questions as to the representativeness of the final sample. Appendix 3 presents the means and standard

deviations of variables used in this study. These means and standard deviations do not indicate any cause for concern.

Regional Dummies, Regional Unemployment Rates and Collinearity

The earnings regressions include three different unemployment measures. These are proxies for the insider-outsider influences that are central to this study. As just discussed these unemployment rates are regional rates. In fact, there are 14 regions identifiable in AWIRS, one for the metropolitan area of each state, one for the non-metropolitan area of each state, and one for each Territory.

Regional influences on wages can be characterised as working in three ways. First, region specific effects may include such things as housing costs. There are significant differences in average housing costs across Australia. These differences may in turn produce systematic wage differences across the regions in the form of compensating differentials. Lifestyle considerations between regions could also generate compensating differentials.

Second, the evidence suggests that there are steady state differences in equilibrium labour market outcomes such as participation and unemployment rates. These differences may be associated with wage differences. Debelle and Vickery (1998), for instance, estimate that Tasmania and South Australia have had higher equilibrium unemployment rates than the other states and territories, over the past two decades.

Third, cross-section results could reflect the impact of labour market adjustment. Debelle and Vickery (1998, p10) show that Western Australia and Queensland enjoyed strong employment growth over a protracted period during the 1980s and 1990s. Indeed these two states increased their share of total employment from 9 to 10, and 14 to 18 per cent respectively from 1981 to 1997. The other states experienced a steady decline in employment share over this time. These employment share trends could generate a positive wage premium associated with the need to attract labour from states and territories with declining, to those with expanding, employment opportunities.

These considerations generate a number of econometric issues. First regional influences on wages which are not directly related to unemployment, but which may be correlated with unemployment, need to be controlled for. Failure to do this may result in omitted variables bias. The estimated coefficients on unemployment will register the impact on earnings of omitted but correlated regional influences, in addition to the impact of regional unemployment.

Second, regional dummies need to be included in order to isolate the impact of permanent and transitory aspects of unemployment on wages. This is important since the insider-outsider mechanism clearly relates to the impact of variations in the transitory component of unemployment on wage formation. Card (1995) has argued that excluding regional

dummies from these kinds of wage equations involves the implicit assumption that wages respond to these two components of local unemployment with the same elasticity. Card shows that this assumption is invalid in the USA, and results in the fact that USA wage curves which omit region dummies, invariably produce low or even positive elasticities (Card, 1995, p789).

The rationale for including regional dummies to control for regional fixed effects in addition to unemployment is clear enough. Including 14 regional dummies, corresponding to the 14 regions for which unemployment rates have been defined, along with 14 regional unemployment rates would however result in perfect collinearity. On the other hand omitting the regional dummies may result in omitted variables bias. These issues have been dealt with as follows in this study. Along with 14 regional unemployment rates, 8 regional dummy variables have been included, one for each state and territory. This eliminates perfect collinearity, enabling the coefficients to be estimated. It does not of course eliminate collinearity as such.

To gauge the impact of collinearity and omitted variables bias on the results the following strategy has been adopted. For each model, an **'a priori preferred specification'** is estimated. This specification **includes the eight regional dummies** as defined above, along with the relevant **regional unemployment measure(s) used to proxy insider-outsider influences**. This is referred to as the **a priori preferred specification** since it is the specification that is most consistent with the relevant underlying theoretical and empirical knowledge.

Each time a model with regional dummy variables is estimated, it is re-estimated without those regional dummy variables. This is done as an attempt to gauge whether the results from the a priori preferred specification are quantitatively or qualitatively affected by collinearity. If for instance, both sets of results tell the same qualitative story, this is taken as evidence that collinearity is not a serious problem. It is possible that the two specifications could tell different, even conflicting stories. It may not be possible to conclude whether the difference in the results is due to collinearity in the a priori preferred specification, or omitted variables bias in the specification that omits regional dummies.

In an attempt to obtain additional information a third specification is estimated. Kennedy and Borland (2000, p789) argue that property values are a major source of interstate cost of living differences in Australia. Thus, following Borland and Kennedy the third specification includes the 14 regional unemployment rates and a variable measuring real median house prices in each state and territory. The house price data used are described in Appendix 2. This specification omits full controls for regional specific fixed effects, but does control for one potentially major source of regional variation in earnings.

Two arguments are offered to justify proceeding in this way. First, there is abundant empirical evidence to support the view that individual wage outcomes are the result of both the characteristics of individual employees, and of the workplaces and industries in which they work. It can be argued that earnings equations that do not control for both

employee and workplace characteristics are compromised by the omission of relevant variables. AWIRS 1995 provides a unique opportunity with respect to Australian data, to match the characteristics of workers with the characteristics of their workplaces. The potential problems that collinearity **might** cause should not deter this work.

Second, there exists an extensive literature on the 'wage curve' (for example see, Blanchflower and Oswald, 1990, 1994 and 1995). An examination of this literature shows that sensible results can be drawn from single cross-sections, notwithstanding the problems that may arise from collinearity and omitted variables bias. The work of Winter-Ebmer (1996) provides one example. Dobbie (2003, pp144-146) contains a detailed review of this aspect of the wage curve literature.

4. Results

Tables 1 and 2 present the results for the male and female samples. In each Table there are three panels, A, B and C. These present the results for the a priori preferred specification (Panel A), the specification that omits regional dummies (Panel B), and the specification that omits regional dummies, but which includes regional median house prices (Panel C). Each table has six columns of results. The first two columns (1A and 1B) present the OLS and random effects estimates for the model that includes the total unemployment rate as an outsider proxy. Columns 2A and 2B present the OLS and random effects results for the version that includes the total unemployment rate and the long-term unemployment proportion. Columns 3A and 3B present the results for the version of the model in which the short-term unemployment rate appears. For ease of exposition in what follows, only the OLS estimates will be discussed.

The discussion turns first to the male sample estimates reported in Table 1. The results in column 1A of panel A indicate that the coefficient of the total unemployment rate is not significantly different from zero. The conclusion drawn from this is that the unemployed are outsiders. None of the coefficients on the regional dummies are significantly different from zero in this specification. The results presented in column 1A of panel B indicate that this conclusion that the unemployed are outsiders, is robust to the exclusion of regional dummies. This makes it unlikely that the lack of statistical significance of the total unemployment rate variable in the results reported in column 1A of panel A is due to collinearity. The results reported in column 1A of panel C attempt to partially control for the possibility of omitted variables bias by including median house prices. Neither this variable, nor the total unemployment rate, is significant.

The numerical magnitude of the estimated coefficients on the total unemployment rate reported in panels A, B and C are very small at 0.012, 0.057 and 0.042 respectively. It is reasonable to conclude that in terms of both size and significance, the results reported in column 1A of panels A, B and C support the hypothesis that the unemployed are outsiders.

The results reported in column 2A of panel A, are from the specification that includes the long-term unemployment proportion, the total unemployment rate and the regional dummies. The coefficients on the long-term unemployment proportion and the total unemployment rate are signed in line with the predictions of the insider-outsider model. Moreover, they are statistically significant at the one and five per cent significance levels respectively. The size of the coefficient on total unemployment increases from 0.012 to 0.203 (see panel A, columns 1A and 2A) when the long-term unemployment proportion is added to the model. The elasticity of wages with respect to the long-term unemployment proportion is 0.39. An elasticity of this magnitude implies that the outsider effect is economically, as well as statistically significant.

The addition of the long-term unemployment proportion leads four of the seven regional dummies to statistical significance. Overall the evidence is that the long-term unemployed are outsiders. It is also reasonable to conclude that the insignificance of the total unemployment rate in column 1A is not the result of collinearity between it and the regional dummies. Rather it reflects the fact that some of these unemployed workers, the long-term unemployed, are outsiders.

This conclusion receives additional support from the results reported in column 3A of panel A. These results show that the short-term unemployed have a significant and negative impact on hourly wages. Once again this is consistent with the view that the short-term unemployed remain attached to the insider group, or that they are potential substitutes for employed insiders. The magnitude of the estimated coefficient on the short-term unemployment rate is 0.12. This is ten times the size of the estimated coefficient on the total unemployment rate reported in column 1A of panel A. In addition, two of the regional dummies are significant in this regression.

None of the estimated coefficients on the unemployment variables, reported in panels B and C, are significantly different from zero. Given that many of the regional dummies in the regressions reported in panel A are statistically significant, it is reasonable to conclude that the results reported in panels B and C suffer from the omission of these regional dummies.

Considering that cross section data is used in this analysis, the values of the coefficient of determination reported in Table 1 are large. Moreover, the F values support the view that the a priori preferred specification, reported in panel A, is also statistically preferred. Ramsey's RESET statistic suggests the absence of specification error in any of the regressions reported in Table 1. The results in Table 1 give clear support to the idea that the insider-outsider distinction is relevant for males.

The results for the female sample are reported in Table 2. The estimated coefficients of the unemployment variables reported in the three columns of panel A are signed in line with the predictions of the insider-outsider model. However they are all statistically insignificant. As usual, the possibility that this lack of significance is due to collinearity is examined by omitting the regional dummy variables and re-estimating the models.

The results reported in column 1A of panels B and C indicate that the total unemployment rate remains insignificant when regional dummies are omitted from the model. However, column 2A of panel B shows that the total unemployment rate, and the long-term unemployment proportion, are both statistically significant, and the estimated coefficients associated with them are signed in line with the predictions of the insider-outsider model. Column 2A of panel C shows that, once median house prices are included in the model, the total unemployment rate is driven to insignificance, while the coefficient of the long-term unemployment proportion remains positively signed, and significant at the five per cent significance level. In panels B and C the magnitude of the coefficient on the long-term unemployment proportion is 0.14 and 0.11 respectively. This is smaller than the corresponding estimates from the male sample.

Considering that cross section data are used in this analysis, the values of the coefficient of determination presented in Table 2 are large. The F statistics indicate that the models are overall significant. Unlike Table 1, the F statistics reported in Table 2 are numerically similar in the results reported in each of the three panels. This suggests that, from a statistical viewpoint, there is nothing between the specifications in panel A, B or C. This is consistent with the absence of a compelling case in favour of the a priori preferred model in the case of the female sample. Ramsay's RESET test suggests the absence of specification error. In sum, the results in Table 2 do provide some evidence in favour of the insider-outsider model. However, that evidence does not come principally from the models that employ the a priori preferred specification. On the contrary the evidence comes from the models that have omitted the regional dummies. As a result this evidence could be subject to omitted variables bias. There is no way to decide further on this issue.

In view of this, two alternative approaches are possible. First, the results for the female sample could be regarded as econometrically unreliable, and judgement regarding this aspect of the research not attempted. Second, some tentative conclusions could be drawn on the assumption that the results from panels B and C are accurate. If the second approach is taken, the following conclusions from the work reported in this paper seem reasonable.

5. Conclusions

First, insider power and outsider ineffectiveness appears to characterise male wage outcomes. This conclusion is drawn on the basis of results that have the a priori preferred specification. This specification is clearly superior to the alternatives reported in panels B and C of Table 1.

Second, there is some evidence that insider-outsider considerations are a feature of wage outcomes in the female sample. The total unemployment rate, when entered on its own, is insignificant in all three panels. Moreover, provided the results in panels B and C are accepted as legitimate, the long-term unemployment proportion and short-term

unemployment rate act as the insider-outsider theory predicts.

Third, the results suggest that males have more insider power than females, all other things being equal. For males, a one per cent increase in the long-term unemployment proportion is translated into a 0.39 per cent increase in hourly wages (see Table 1, column 2A of panel A). The corresponding figure for females is either 0.11 or 0.14, depending on which model is used (see Table 2, column 2A of panels B and C). These estimates imply that employed males can turn an increase in the 'density of outsiderness' into a larger wage increase than can their employed female counterparts. This is what would be expected if insider power is explained, either fully or partially, by turnover costs.

Table 1
MALES

OLS and Random Effects Estimates. Dependent Variable is Log Hourly Wage. Number of observations = 2494

	OLS 1A	RE 1B	OLS 2A	RE 2B	OLS 3A	RE 3B
			PANEL A			
Insider-Outsider Variables						
Total unemployment rate	-0.012	-0.021	-0.203*	-0.307#		
	(-0.163)	(-0.212)	(-2.367)	(-1.870)		
Long-term unemployed proportion			0.390**	0.445*		
			(3.459)	(2.225)		
Short-term unemployed rate					-0.120*	-0.236*
					(-2.518)	(-2.189)
Employment change	0.014	0.021	0.012	0.015	0.017	0.017
	(1.071)	(1.195)	(0.890)	(0.722)	(1.275)	(0.689)
Region (VIC omitted)						
NSW	0.002	-0.005	0.003	0.002	0.012	0.028
	(0.146)	(-0.234)	(0.199)	(0.104)	(0.677)	(0.891)
ACT	0.084	0.078	0.339**	0.386*	0.107	0.190
	(0.893)	(0.896)	(2.823)	(2.283)	(1.156)	(1.624)
TAS	-0.046	-0.033	-0.065#	-0.104	-0.047	-0.120
	(-1.391)	(-0.881)	(-1.896)	(-1.584)	(-1.518)	(-1.483)
NT	-0.072	-0.0006	0.109	0.137	-0.039	-0.008
	(-1.524)	(-1.089)	(1.489)	(0.397)	(-0.830)	(-0.021)
QLD	0.020	-0.0008	0.185**	0.202*	0.054*	0.084#
	(0.911)	(-0.034)	(3.468)	(2.227)	(2.100)	(1.734)
SA	-0.033	-0.021	-0.015	-0.007	-0.041#	-0.052
	(-1.366)	(-0.818)	(-0.637)	(-0.187)	(-1.692)	(-1.153)
WA	-0.011	0.014	0.174**	0.169	-0.0004	-0.012
	(-0.424)	(0.521)	(2.839)	(1.638)	(-0.016)	(-0.233)
R-squared	0.426		0.429		0.428	
Adjusted R-squared	0.410		0.412		0.411	
RESET	0.126		0.070		0.113	
Model F	134.29**		132.34**		133.51**	
	OLS 1A	RE 1B	OLS 2A	RE 2B	OLS 3A	RE 3B
			PANEL B			
Insider-Outsider Variables						
Total unemployment rate	-0.057	-0.087	-0.061	-0.161		
	(-0.908)	(-1.058)	(-0.844)	(-1.389)		
Long-term unemployed proportion			0.003	0.032		
			(0.101)	(0.588)		
Short-term unemployed rate					-0.026	-0.051
					(-0.673)	(-0.918)
Employment change	0.014	0.015	0.014	0.016	0.012	0.013
	(1.051)	(0.897)	(1.054)	(0.820)	(0.941)	(0.789)
R-squared	0.425		0.425		0.425	
Adjusted R-squared	0.410		0.410		0.410	
RESET	0.033		0.031		0.025	
Model F	43.93**		43.42**		44.09**	

Table 1 continued						
	OLS 1A	RE 1B	OLS 2A	RE 2B	OLS 3A	RE 3B
			PANEL C			
Insider-Outsider Variables						
Total unemployment rate	-0.042	-0.062	-0.021	-0.087		
	(-0.649)	(-0.728)	(-0.268)	(-0.635)		
Long-term unemployed proportion			-0.015	-0.001		
			(-0.418)	(-0.028)		
Short-term unemployed rate					-0.029	-0.054
					(-0.747)	(-0.964)
Employment change	0.015	0.017	0.015	0.018	0.015	0.017
	(1.155)	(1.010)	(1.161)	(0.886)	(1.120)	(0.981)
Regional control						
House Prices	0.028	0.042	0.034	0.054	0.034	0.050
	(0.959)	(1.077)	(1.064)	(1.012)	(1.214)	(1.355)
R-squared	0.425		0.425		0.425	
Adjusted R-squared	0.410		0.410		0.410	
RESET	0.035		0.050		0.025	
Model F	43.33**		42.71**		43.45**	

Notes: **, *, #, indicates significance at 1%, 5% and 10% respectively. The t-ratios (in brackets) in the OLS regressions have been corrected for heteroscedastic error structures using White's (1980) procedure. Each regression reported in this table contains approximately 50 other control variables, the coefficient estimates for which have not been reported here.

Table 2
FEMALES

OLS and Random Effects Estimates. Dependent Variable is Log Hourly Wage. Number of observations = 1507

	OLS 1A	RE 1B	OLS 2A	RE 2B	OLS 3A	RE 3B
			PANEL A			
Insider-Outsider Variables						
Total unemployment rate	-0.047	-0.044	-0.131	-0.126		
	(-0.454)	(-0.502)	(-1.109)	(-1.063)		
Long-term unemployed proportion			0.141	0.041		
			(0.997)	(0.386)		
Short-term unemployed rate					-0.025	-0.013
					(-0.370)	(-0.197)
Employment change	-0.019	-0.104	-0.018	0.004	-0.019	-0.010
	(-1.143)	(-0.694)	(-1.087)	(0.316)	(-1.143)	(-0.696)
Region (VIC omitted)						
NSW	0.017	0.026	0.016	0.036	0.022	0.029#
	(0.788)	(1.431)	(0.724)	(1.623)	(1.064)	(1.680)
ACT	-0.116	-0.105	-0.023	-0.027	-0.101	-0.093
	(-1.490)	(-1.340)	(-0.192)	(-0.447)	(-1.330)	(-1.204)
TAS	0.015	0.007	0.005	0.023	0.008	0.001
	(0.323)	(0.140)	(0.115)	(0.419)	(0.162)	(0.029)
NT	0.113	0.148	0.179	0.156	0.125	0.156
	(0.860)	(0.877)	(1.200)	(1.048)	(0.943)	(0.922)
QLD	-0.062*	-0.044*	-0.004	-0.024	-0.053#	-0.039
	(-2.546)	(-2.065)	(-0.074)	(-0.550)	(-1.860)	(-1.465)
SA	-0.051#	-0.029	-0.042	-0.031	-0.054#	-0.033
	(-1.771)	(-1.100)	(-1.481)	(-1.137)	(-1.876)	(-1.228)
WA	-0.021	-0.031	0.041	-0.021	-0.011	-0.023
	(-0.482)	(-1.038)	(0.528)	(-0.459)	(-0.304)	(-0.824)
R-squared	0.354		0.355		0.354	
Adjusted R-squared	0.324		0.324		0.324	
RESET	0.001		0.0007		0.0007	
Model F	15.71**		15.64**		15.79**	
	OLS 1A	RE 1B	OLS 2A	RE 2B	OLS 3A	RE 3B
			PANEL B			
Insider-Outsider Variables						
Total unemployment rate	-0.051	-0.019	-0.214*	-0.224**		
	(-0.629)	(-0.256)	(-2.269)	(-2.672)		
Long-term unemployed proportion			0.146**	0.049		
			(3.451)	(1.248)		
Short-term unemployed rate					-0.091#	-0.087
					(-1.823)	(-1.422)
Employment change	-0.019	0.0007	-0.018	0.010	-0.017	0.007
	(-1.145)	(0.048)	(-1.124)	(0.685)	(-1.059)	(0.473)
R-squared	0.348		0.352		0.349	
Adjusted R-squared	0.320		0.324		0.321	
RESET	0.0046		0.001		0.064	
Model F	16.49**		16.95**		16.81**	

Table 2 continued						
	OLS 1A	RE 1B	OLS 2A	RE 2B	OLS 3A	RE 3B
			PANEL C			
Insider-Outsider Variables						
Total unemployment rate	0.015	-0.017	-0.144	-0.255**		
	(0.179)	(-0.228)	(-1.312)	(-2.720)		
Long-term unemployed proportion			0.114*	0.145**		
			(2.419)	(3.092)		
Short-term unemployed rate					-0.093#	-0.091
					(-1.854)	(-1.519)
Employment change	-0.020	0.004	-0.019	0.002	-0.017	0.005
	(-1.204)	(0.314)	(-1.155)	(0.197)	(-1.058)	(0.337)
Regional control						
House Prices	0.107**	0.034*	0.056	0.056#	0.106**	0.078**
	(2.772)	(2.073)	(1.296)	(1.866)	(2.903)	(2.680)
R-squared	0.351		0.353		0.352	
Adjusted R-squared	0.323		0.325		0.324	
RESET	0.097		0.020		0.026	
Model F	16.71**		16.80**		17.03**	

Notes: **, *, #, indicates significance at 1%, 5% and 10% respectively. The t-ratios (in brackets) in the OLS regressions have been corrected for heteroscedastic error structures using White's (1980) procedure. Each regression reported in this table contains approximately 50 other control variables, the coefficient estimates for which have not been reported here.

Appendix 1

Regional Unemployment Rates Used in this Study

REGION	TOTAL UNEMPLOYMENT RATE (%)	SHORT-TERM UNEMPLOYMENT RATE (%)	LONG-TERM UNEMPLOYMENT PROPORTION (%)
NSW MET	9.07	3.88	34.63
NSW NON MET	10.76	4.23	40.05
VICTORIA MET	10.49	3.68	38.61
VICTORIA NON MET	9.87	4.00	34.89
QUEENSLAND MET	8.58	4.75	21.6
QUEENSLAND NON MET	10.73	4.86	26.41
SOUTH AUSTRALIA MET	11.29	3.93	35.38
SOUTH AUSTRALIA NON MET	8.07	2.00	43.24
WESTERN AUSTRALIA MET	9.34	4.74	22.6
WESTERN AUSTRALIA NON MET	7.59	2.66	20.46
TASMANIA MET	13.25	5.45	41.45
TASMANIA NON MET	11.09	2.78	44.09
NORTHERN TERRITORY	8.89	4.72	21.78
AUSTRALIAN CAPITAL TERRITORY	8.83	4.59	17.33

NOTES: Short-term unemployment is defined as 13 weeks or less. Long-term unemployment is 52 weeks or more. The data for these estimates was provided by the Australian Bureau of Statistics and are based on unpublished *Labour Force Survey (6203.0)* data.

Appendix 2

Real Median House Prices, Capital Cities, September 1995

CITY	$1000s
Sydney	170.85
Melbourne	118.24
Brisbane	111.67
Adelaide	90.92
Perth	107.96
Hobart	85.28
Canberra	128.84
Darwin	135.98

Source: Unpublished data supplied by the Real Estate Institute of Australia Ltd. Deflated using Australian Bureau of Statistics *Consumer Price Index*, Catalogue no. *6401.0*.

Appendix 3
Variable definitions; Means and Standard Deviations
(Note: The first number in each cell is the mean, the number beneath is the standard deviation)

Variable	Definition	MALE	FEMALE
Dependent Variable			
Log hourly pay	Log of Gross pay per week divided by hours worked each week.	2.82 0.40	2.56 0.36
Insider-outsider variables			
Short-term unemployed	Log short-term unemployment rate. Regional unemployed for less than or equal to13 weeks, as a percentage of regional labour force.	1.39 0.15	1.39 0.15
Total unemployed	Log regional unemployment rate. Regional unemployed as a percentage of regional labour force.	2.29 0.10	2.29 0.10
Long-term unemployed	Proportion of regional unemployment that is long-term. Log of regional long-term unemployment, expressed as a percentage of total unemployment in the region.	3.49 0.22	3.49 0.22
Employment change	Dummy variable: Equals 1 if employment change at workplace was positive in proceeding 12 months.	0.51 0.50	0.57 0.49
Workplace Variables			
Active union	Dummy variable: Equals 1 if the senior delegate from the union with most members spends one hour or more each week on union activities, and either a general meeting of members is held at least once every six months, a union committee exists and meets regularly with management, or delegates meet with management at least once a month.	0.56 0.50	0.36 0.48
Unionisation	Proportion of employees at workplace who are union members.	0.63 0.28	0.58 0.31
Workplace size			
20-49 (omitted category)	20-49 employees at workplace.	0.14 0.34	0.12 0.32
50-99	50-99 employees at workplace.	0.21 0.41	0.20 0.40
100-199	100-199 employees at workplace.	0.26 0.44	0.29 0.45
200-499	200-499 employees at workplace.	0.24 0.43	0.24 0.43
500-1000	500-1000 employees at workplace.	0.12 0.32	0.11 0.32
1000+	1000 or more employees at workplace.	0.04 0.04	0.03 0.17

	Appendix 3 continued		
Variable	**Definition**	**MALE**	**FEMALE**
Labour intensity	Labour costs as a proportion of total costs. The variable is measured as a scale going from 1 to 6 representing less to more labour intensive.	2.35 1.08	2.45 1.16
Foreign	Dummy variable: Equals 1 if workplace is majority foreign owned.	0.27 0.44	0.16 0.36
Import competing	Dummy variable: Equals 1 if workplace faces import competition for it's major product or service.	0.45 0.49	0.33 0.47
Export	Dummy variable: Equals 1if more than 50% of main product or service is exported.	0.15 0.36	0.05 0.23
*Occupational composition of workplace***.**			
% Managers	Managers as a percentage of total employment at workplace.	5.41 4.62	5.89 4.84
% Professionals	Professionals as a percentage of total employment at workplace.	4.60 7.00	4.06 9.18
% Tradespeople	Tradespeople as a percentage of total employment at workplace.	18.91 21.63	7.11 11.88
% Clerical	Clerical as a percentage of total employment at workplace.	11.04 13.71	13.24 19.22
% Salespeople	Salespeople as a percentage of total employment at workplace.	9.72 21.77	33.97 37.96
% Plant and mach operators	Plant and machine operators as a percentage of total employment at workplace.	23.80 25.92	9.93 19.99
% Labourers	Labourers as a percentage of total employment at workplace.	19.08 23.21	17.42 24.06
% Para-prof (omitted category)	Para-professionals as a percentage of total employment at workplace.	7.40 12.96	8.35 17.19
Competition in product market	Dummy variable: equals 1 if firm has many competitors in product market, equals zero if firm has no competitors.	0.53 0.49	0.65 0.47
% Female	Percentage of workplace workforce which is female.	22.80 21.17	55.06 24.75
Individual Variables			
Experience	Age – (years at school + 5)	20.63 11.83	16.99 11.83
Tenure	Years employed at workplace.	7.82 7.76	5.02 5.34
Non-English Speaking home	Dummy variable: Equals 1 if employee comes from a non-English speaking home.	0.06 0.24	0.07 0.25
Disabled	Dummy variable: Equals 1 if a health condition or disability exists which is likely to last beyond six months.	0.08 0.28	0.06 0.25

	Appendix 3 continued		
Variable	**Definition**	**MALE**	**FEMALE**
Occupation			
Plant and machine operators	Dummy variable: Equals 1 if employed in occupational group, Plant and Machine Operators and Drivers.	0.23 0.42	0.03 0.17
Sales	Dummy variable: Equals 1 if employed in occupational group, Sales and Personal Services.	0.08 0.27	0.33 0.47
Clerks	Dummy variable: Equals 1 if employed in occupational group, Clerks.	0.05 0.23	0.27 0.44
Tradesperson	Dummy variable: Equals 1 if employed in occupational group, Tradesperson and Apprentices.	0.22 0.41	0.02 0.13
Para-prof	Dummy variable: Equals 1 if employed in occupational group, Para-professionals.	0.08 0.28	0.07 0.25
Professional	Dummy variable: Equals 1 if employed in occupational group, Professionals.	0.08 0.26	0.06 0.24
Manager	Dummy variable: Equals 1 if employed in occupational group, Managers.	0.08 0.28	0.04 0.19
Other occupation	Dummy variable: Equals 1 if not able to be classified in the other occupational categories.	0.01 0.08	0.01 0.07
Labourers (omitted category)	Dummy variable: Equals 1 if employed in occupational group, Labourers and Related Workers.	0.15 0.36	0.19 0.39
Educational level			
Primary education	Dummy variable: Equals 1 if attended primary school but not secondary school.	0.03 0.18	0.02 0.15
Some secondary	Dummy variable: Equals 1 if attended, but did not complete secondary school.	0.31 0.46	0.40 0.49
Skilled vocational	Dummy variable: Equals 1 if highest educational level is skilled vocational qualification.	0.23 0.42	0.05 0.21
Associate diploma	Dummy variable: Equals 1 if highest educational attainment is Associate diploma /advanced certificate.	0.08 0.28	0.09 0.29
Degree	Dummy variable: Equals 1 if highest educational attainment is undergraduate degree or a diploma.	0.09 0.29	0.10 0.30
Postgraduate	Dummy variable: Equals 1 if highest educational attainment is a Postgraduate degree or diploma.	0.04 0.20	0.03 0.18
Basic vocational	Dummy variable: Equals 1 if highest educational level is basic vocational qualification.	0.02 0.16	0.05 0.23
Completed secondary school (omitted category)	Dummy variable: Equals 1 if completed not higher than secondary school.	0.18 0.15	0.25 0.43
Fixed term contract	Dummy variable: Equals 1 if employment contract ends on a fixed date.	0.06 0.25	0.06 0.24
Casual	Dummy variable: Equals 1 if not entitled to both paid holiday or sick leave.	0.08 0.28	0.20 0.40
School*exp	Years of formal schooling times potential experience	246.5 139.1	203.1 137.2

	Appendix 3 continued		
Variable	**Definition**	**MALE**	**FEMALE**
Region Dummies and House Prices			
NSW	Dummy variable: Equals 1 if workplace is in New South Wales.	0.33 0.47	0.32 0.46
ACT	Dummy variable: Equals 1 if workplace is in the Australian Capital Territory.	0.01 0.07	0.01 0.09
TAS	Dummy variable: Equals 1 if workplace is in Tasmania.	0.03 0.18	0.02 0.15
NT	Dummy variable: Equals 1 if workplace is in the Northern Territory.	0.0004 0.02	0.01 0.04
QLD	Dummy variable: Equals 1 if workplace is in Queensland.	0.17 0.38	0.19 0.39
SA	Dummy variable: Equals 1 if workplace is in South Australia.	0.08 0.27	0.08 0.28
WA	Dummy variable: Equals 1 if workplace is in Western Australia.	0.08 0.28	0.06 0.24
VIC (omitted category)	Dummy variable: Equals 1 if workplace is in Victoria.	0.28 0.44	0.30 0.46
House Prices	Real Median House Price in each capital city (log)	4.86 0.21	4.86 0.21

Note: Unweighted means and standard deviations for workplaces with 20 or more employees.

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