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Labour Underutilisation in Metropolitan Labour Markets: Individual and Contextual Factors

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1. Introduction

The purpose of this paper is to develop an analysis of the associations between individual level labour market outcomes, the personal and family characteristics of the individual and the characteristics of local labour market contexts. Problems associated with broad labour market outcomes have always been considered central to understanding questions of disadvantage, poverty and social exclusion. While researchers and policy makers are keenly interested in official unemployment rates, with the dominant concern focusing on the contrasts between people with jobs with those who are officially unemployed, it is generally agreed that the assumptions underpinning this division are no longer valid as the boundaries between work and non-work have become increasingly fluid (Beck 1992, Dooley and Catalano 2003). A stylised view of labour markets now includes reference to increasing casualisation of jobs and a rise in part-time employment, a growth in so-called good jobs and bad jobs, an increase in the reference period for long-term unemployment and a more complex picture of occupation and employment mobility that may also include periods of marginal labour market attachment. In short this increasingly fluid picture is no longer just a divide between employment and unemployment but is now increasingly multi-dimensional.

In the face of these changing employment dynamics labour underutilisation is seen as an increasingly important concept for articulating a wide range of employment hardship and disadvantage (Jensen et al. 1999, Carter 1982, Clogg 1979, Hauser 1974). In that unemployment is considered to underestimate the true level of joblessness, an accurate understanding of underutilisation is required so as to inform and enable appropriate responses and reasoning within policy debates. Moreover concerns are expressed about the extent of the underutilisation problem, because like unemployment more generally, labour underutilisation has significant impacts on economic efficiency, social isolation and exclusion and individual wellbeing (Booley and Catalano 2003). Defining labour underutilisation moves beyond the narrow notion of unemployment to include other types of inadequate employment or other forms of dislocation from the labour market. It includes individuals who want to work but are not included in ILO definitions of unemployment because they are not actively seeking employment, and it also includes individuals who are not working full time but would like to work more hours. Within broader definitions it also may include individuals who are working full time or part time voluntarily but who receive very low wages (working poor) and those who are employed in jobs that are classified as low skilled relative to the individual's qualifications.

Existing research clearly points to the need to account for the broad range of multi-dimensional and multi-scalar factors which impact on labour market outcomes. For academic researchers multi-scalar, multi-dimensional approaches to understandingly social and economic outcomes have become increasingly popular. There has been a long history in education research and increasingly in sociology and other social sciences in considering the ways that different multi-scalar constructs impact on outcomes at different levels of scale. In some of this research the focus has been on understanding the ways in which individual level outcomes are influenced by broad social and geographic (community, neighbourhood, regional) scales. Such an approach is placed within a larger developing international social science literature seeking to connect changes from the global to the local, or the macro to the micro, and

understanding the associations between these changes on human life (Briggs 2003, Sampson *et al.* 2002, Friedrichs et al. 2005). This agenda focuses on

- Understanding the impacts of neighbourhood effects or area effects or more broadly the impacts of interactions between people and place.
- Conceptualising the hierarchical nature of social phenomena and the way in which individual-level outcomes are reflected in the uneven spatial impacts on labour markets, housing markets and other broad contextual issues, together with the impact of individual level characteristics arguing that the broad impacts are linked because of where particular people live and their roles in society and the economy.
- Establishing that understanding the effects of people and place is becoming increasingly crucial as individuals, households and local communities face continued economic restructuring and large-scale social and demographic change and as policy makers and researchers try to understand the impacts and outcomes of these changes.

Encouraged by the need to provide broader understandings of labour underutilisation, this paper suggests a holistic model of labour market outcomes within Australian metropolitan labour markets. Specifically the paper uses individual and aggregate level data and applies multinomial logit models to consider the association between labour underutilisation and a range of individual and contextual factors. The analysis allows us to consider the multi-dimensional or multi-scalar nature of underutilisation risk and provides a useful broad framework with which to consider appropriate policy responses. In what follows we first consider the individual and contextual issues associated with understanding the risk of underutilisation before discussing in detail the methods and data adopted for the analysis. Following this we present the findings from our analysis, before undertaking a discussion of their implications.

2. Labour underutilisation: individual and contextual issues

As a genre of broader labour market research, the study of labour underutilisation can be understood from a range of conceptual approaches developed across a number of social science disciplines. Often these approaches are piecemeal, focusing on narrowly defined drivers and processes. However, there has been an increasing movement towards utilising a framework focusing on aspects of employability (McQuaid et al. 2005, McQuaid and Lindsay 2005). Employability includes both narrowly defined individual assets—labour supply—but more broadly also introduces issues such as job search, labour market regulation and labour market demand. Narrow definitions are often associated with neo-liberal foci on improving individual's capacity to perform in the labour market (Confederation of British Industry 1999), while broader definitions move beyond this to provide a more holistic approach which considers employability to be

> the capability to move into and within labour markets and to realise potential through sustainable and accessible employment. For the individual, employability depends on: the knowledge and skills they possess, and their attitudes; the way personal attributes are presented in the labour market; the environmental and social context within which work is sought; and the economic context within which work is sought (DHFETE 2002, p. 7, see McQuiad and Linsday 2005 for a range of definitions).

Heuristically, the broad employability framework resembles the model shown in figure 1 with individual labour market outcomes seen as a function of three interrelated factors including individual and personal circumstances and external or contextual factors (McQuaid and Lindsay 2005, see also Galster and Killen 1995). The first two relate to individual and personal circumstances and are thought of as factors influencing labour supply. The third set of factors are considered largely external to the individual and can be seen as representing a broad range of contextual factors including those characteristic of labour market demand (McQuaid 2006). Individual characteristics that include skills and attributes such as basic education, transferable skills, demographic characteristics, health and well-being, job seeking skills and an individual's level of adaptability and mobility. Personal characteristics, such as education formal and learned job skills, social status, age etc are often included in models attempting to understand labour market outcomes. Other factors such as an indivdual's health and wellbeing, together with an individual's job seeking behaviour and knowledge which may act to funnel information about known jobs (possibly in connection with an individuals social networks) are also important. Lastly, adaptability and mobility refers to the extent to which an individual is willing to change/adapt to meet changing labour market conditions or in some cases be geographically mobile (McQuaid and Lindsay 2005).

Personal circumstances include many socio-economic contextual factors which generally relate to an individual's social, family and household circumstances. Household circumstances which may include the need to care for children or elderly parents may act as an important constraint on employability. Family background can impact on an individual's opportunity structure via the influence of personal characteristics of the individual, but also through the impact of social networks and social capital of parents and other intergenerational effects which impact on social capital more generally (Case and Katz 1991). Importantly, the impact that social networks might have on an individual's employment outcomes is widely discussed in the research literature and includes the impact on perceived and real opportunity structures and individual aspirations and preferences (Holzer 1988, Buck 2001, Elliott 1999).

The impact of local or regional resources or local contextual factors is most often related to the quality, quantity and diversity of institutions at a neighbourhood or local level. It refers to 'the array of markets and institutions that provide the potential means of social mobility within which an individual may interact, such as labour, housing and financial markets, schools and the social welfare and criminal justice systems' (Galster 2002, p. 6). McQuaid and Linsday (2005) refer to these factors as a range of external influences that include local labour market demand, the nature of national macro-economic demand and enabling support factors such as local jobs policies, governance or the local labour control regime (Helms and Cumbers 2005, Peck 1998, Jonas 1996).In understanding labour underutilisation the spatial organisation of metropolitan employment opportunities is important. Segmented local labour market regions will mean that demand is likely to be significantly different between geographically separate labour market regions or zones. Similarly the extent to which there is non-local competition for jobs from in-commuting may also be important in influencing demand for local workers. (Bailey and Turok 2000, Bill et al. 2005).

3. Methods and data

3.1 Methods

The investigation of the impacts and associations between individual behaviour and outcomes has, as pointed out by Galster (2003), assumed several methodological guises with the focus often being on the best way to account for data that is hierarchical or composed of indicators taken at different levels of measurement. In the case of the current research we are faced with data measured at the individual level together with data measured at the labour market region level. In order to consider the issues raised in this paper we run a series of multivariate logit models which take into account the clustering of observations at the level of the local labour market region.

We estimate a range of multi-nominal logit models with individual respondents placed in one of four categories depending on responses to a range of questions regarding their employment situation. The four categories used are:

- Adequately employed-Employed persons who do not fit the categories below, including those that are working part-time voluntarily;
- Involuntarily part-time- persons who are working part-time, but would like to work more hours (under-employed);[1]
- Unemployed; Persons not working but actively looking for work;
- Sub-unemployed (Discouraged worker, also known as hidden unemployed) - persons not working and not looking for work, who would take a job if one became available.[2]

The models are built up in several stages:

- Model 1: individual level predictors, showing differences in labour underutilisation risk between respondents with different socio-economic and demographic characteristics;
- Model 2: Model 1 plus the addition of predictors accounting for personal circumstances, showing the added difference of personal circumstances on labour underutilisation risk;
- Model 3: Model 2 plus the addition of local labour market predictors, showing the added difference of local labour market demand conditions on labour underutilisation risk

3.2 Data

The data used in this paper has come from the Household, Income and Labour Dynamics in Australia (HILDA) survey and aggregate level data from the Australian Bureau of Statistics (ABS). The HILDA survey is a broad social and economic survey

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[1] Involuntary part-time was calculated from two survey responses—whether the respondent was full-time or part-time and if they specifically wished to work more hours. In category may or may not include part-time people who are constrained to working part-time due to for example child care responsibilities.

[2] Although discouraged workers may be difficult to measure we have drawn this category from a direct survey response that asked those outside of the labour force whether they would take work if it came available. This includes respondents who prefer to look after children, but would take a job if one became available and those who are sick and may return to work at a later stage.

conducted annually which contains information on employment, individual socio-economic characteristics and household/family characteristics. It also contains identifiers that allow broad spatial characteristics (such as labour market or local area available from census data and labour force surveys) to be considered. This current paper considers the first wave of the HILDA survey (2001) with subsequent papers considering longitudinal outcomes. The wave one survey file contains a total of around 19,000 respondents. A reduced data set is used in this paper, that includes individuals of working age defined as either adequately employed, involuntarily working part-time, unemployed or sub-unemployed and who are living in the major metropolitan regions. This reduced data set includes 5372 individuals.

As well as including standard demographic and socio-economic predictors, we model the impact of local labour market effects using data relating to Australian Bureau of Statistics labour force survey regions. A total of 36 regions are included. Data is taken from the ABS census product which includes information on individuals both at their place of residence and their place of employment and also information relating to journey to work. This allows us to construct local labour market variables accounting for the general strength of the local labour market, but also characteristics accounting for the types of local jobs available and the extent to which local workers are able to gain local employment.

4. Labour underutilisation in metropolitan labour markets

4.1 Preliminary analysis

Table 1 presents the preliminary analysis of employment outcomes. It confirms that there is likely to be significant differences in labour market outcomes across individuals differentiated by socio-economic and demographic characteristics. Reflecting existing research, older age groups, are associated with lower levels of labour underutilisation, while standard markers of labour market disadvantage such as indigenous status or English proficiency or low formal education are associated with higher levels of labour underutilisation. The variable for gender suggests a mixed outcome with females having higher rates of involuntary part-time employment and sub-unemployment compared to males. For respondents in couple households with dependent children sub-unemployment is relatively high and for respondents in single parent households with dependent children all categories of underutilisation appear important. The variables accounting for personal circumstances are also illustrative of the associations that may exist. In terms of family/household background both predictors suggested that there may be an association with higher levels of labour underutilisation, while the same holds for the social capital index. Finally, in this preliminary analysis the three measures of local labour market strength and characteristics while not large are suggestive of some potential differences.

To explore the associations between the range of independent variables and underutilisation in a more meaningful way we fit a series of multinomial logit models using the four categories of employment outcome. We build the models in three stages as described in the section above. The results of the three separate models are presented in tables 2 to 4. The tables contain the regression coefficient, robust standard errors and the relative risk ratio for each category of underutilisation relative to the reference category ‘adequately employed’. In all cases values on the relative risk ratio above one indicate that higher values of the explanatory variable increase the predicted probability of being in the particular category of underutilisation,

compared to being adequately employed. Coefficients less than one indicate the opposite. The constant is interpreted in the usual way.[3]

4.2 Individual level predictor model

We begin by modelling only the individual level predictors. The first three columns of table 2 report the result for the relative risk of being involuntarily employed part-time versus adequately employed. An analysis of table 2 reveals that the coefficients on the age variables are significant at the 1% level. Older cohorts are significantly less likely to be involuntarily part-time compared with being adequately employed. The coefficient of the education variable is significant and largely reflects existing studies. Having a lower level of formal education is associated with an increased risk of being employed involuntarily part-time. Importantly the significant gender variable suggests that females are more likely to be classified as involuntary part-time. Having a disability typically restricts the job opportunities available to an individual and consequently the coefficient on the variable accounting for the presence of a long-term disability is positive and significant. The final significant variable for the category involuntary part-time is the indicator of residential mobility. Having moved in the 12 months prior to the survey significantly decreases the relative risk of being involuntarily employed part-time.

The second category of underutilisation is unemployed versus adequately employed, with the outcomes reported in columns 5 to 7 in table 2. Largely the significant variables reflect the vast amount of research exists which purports to understand supply–side factors that predict unemployment. The two age variables are significantly related to the relative risk of unemployment with negative coefficients in both cases. The education variable is positively associated with unemployment illustrating the expected relationship between negative labour market outcomes and lower levels of education. The significant negative gender coefficient is in direct contrast to the outcome for the previous category of underutilisation and suggests that like other studies, unemployment risk is much higher for men than women. The variable indicating indigenous background (ATSI) is included so as to account for the impact of racial disadvantage associated with employment outcomes. The ATSI variable is highly significant and suggests that the risk of unemployment is a significant issue for individuals from an indigenous background. The variable ENG_PROF may record the impact of racial or ethic background on employment outcomes or may also be implicated in the impacts of human capital on disadvantaged labour market outcomes. This variable is significant at the 1% level illustrating that poor English proficiency is associated with an increased relative risk of unemployment. The variable DISABLE had the expected significant positive association with unemployment. The final variable MOVED is significant at the 1 % level and indicates that respondents who had moved in the past 12 months had an increased relative risk of being unemployed.

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[3] In multinomial logit model, one of the response categories is taken as the reference case and then we use this case to compute the log-odds for all other response categories relative to it. Thus the constant term is the multinomial logit estimate for unemployed relative to the reference category (adequately employed) when the explanatory variables are evaluated at zero. Typically we would mean-centre the explanatory variables so the constant applicable to unemployed gives the logit of being unemployed versus adequately employed (reference category) when the explanatory variables take their average values.

The final three columns of table two present the results for the final category of underutilisation, sub-unemployed or discouraged workers. The age variables show only a weak association with the relative risk of sub-unemployment being lower with increasing age. The MIN_ED variable is again significant reflecting the positive association between low human capital and the risk of underutilisation generally. The GENDER variable has a significant coefficient and indicates that like the category of involuntary part-time workers, females are more likely to be sub-unemployed or a discouraged worker. The variable ENG_PROF is highly significant suggesting that poor English skills are associated with increased relative risk of sub-unemployment or being a discouraged worker. As with the previous categories of underutilisation the variable accounting for disability is positive and significant. Finally, undertaking recent residential mobility is significant and positive illustrating that respondents who have moved recently have a higher relative risk of being sub-unemployed or a discouraged worker.

4.3 Individual and personal circumstances predictor model

Table 3 presents the outcomes of the multinomial logit model including the independent variables accounting for individual and personal circumstances. Adding the predictors accounting for aspects of personal circumstances changes the individual level predictor variables only marginally. The most significant change is to render the age 45 to 64 years variable on the category sub-unemployed no longer significant.

Columns 2 to 4 contain the results for the sub-category involuntary part-time versus adequately employed. The two variables accounting for the presence of dependent children (COUPLE_KIDS, SINGLE_KIDS) are both significant. In both cases the presence of dependent children appears to increase the relative risk of involuntary part-time employment. The variable 'parents born overseas' is significant at the 5% level and suggests that respondents whose parents were born in an non-English speaking country were at a higher risk of being involuntarily employed part-time. The variable 'social networks' is highly significant. The significant coefficient on the social networks variable indicates that the risk of being employed involuntarily part-time is associated with weaker social networks.

Columns 5 to 7 present the results for the category unemployment versus adequately employed. All three variables accounting for personal circumstances are significant. The variable SING_KIDS is significant and illustrates the disadvantaged position often associated with single parent families. The variable 'parents work' accounts for the presence of positive work role models in a respondent's childhood household. The positive coefficient on this variable indicates that the presence of positive role models is important to labour market outcomes and situations where such role models are absent are associated with a higher relative risk of unemployment. The significant coefficient on the variable accounting for parental country of birth indicates that having parents born in a non-English speaking country is associated with an increased relative risk of unemployment. Finally the social networks variable is negative suggesting that the often hypothesised association between unemployment and weak social networks is supported in this case.

The results for the final sub-category of underutilisation are presented in columns 8 to 10 of table three. For the category of sub-unemployed or discouraged worker the signs of the coefficients are similar to those for the previous unemployment category. The presence of dependent children is significant for both respondents from couple families and single parent families. In both cases there is an increased risk of sub-

unemployment. The positive coefficient on the variable accounting for having parents in paid employment during childhood indicates that the presence of positive role models is also important for understanding the relative risk of being sub-unemployed or a discouraged worker. The significant coefficient on the variable accounting for parental country of birth indicates that having parents born in a non-English speaking country is associated with an increased relative risk of being sub-unemployed or a discouraged worker. Finally the social networks variable is negative suggesting that the relative risk of being sub-unemployed or a discouraged worker is higher in the presence of weaker social networks.

4.4 Individual, personal circumstances and local labour market predictor model

The final multinomial logit model includes all three levels of predictors. The addition of the local labour market predictors only result in a minor change in the magnitude of the individual level and personal circumstances level predictors. The only significant change is that the variable accounting for residential mobility is no longer significant in relation to involuntary part-time employment.

The results for the category involuntary part-time employment are presented in columns 2 to 4 of table 4. Not surprisingly, the number of part-time jobs available in a local labour market is significantly associated with the relative risk of being involuntarily employed part-time. This can be taken to suggest that the extent to which a local labour market has adequate quality (i.e. full-time jobs) for all people who want them is a significant issue in understanding labour market outcomes at the individual level. The variable LMR self containment accounts for the extent to which there is in-commuting into the local labour market which may result in increased competition for local jobs. For the sub-category involuntary part-time employment this variable is significant at the 1% level suggesting that local labour markets that have more self containment (less in-movement) are associated with a reduced relative risk of being involuntarily part-time.

The results for the second category of underutilisation, unemployment versus adequately employed are presented in columns 5 to 7 of table 4. Only one of the suspected outcomes is significant. The significant coefficient on the variable LMR employment rate indicates that generally stronger local labour markets are associated with a reduced risk of unemployment.

Finally the results for the third category of underutilisation, sub-unemployed or discouraged workers, are presented in the last three columns of table 4. As with unemployment there is a significant association between local labour market strength and sub-unemployment with increases in local labour market strength reducing the relative risk of being sub-unemployed or a discouraged worker. In this case weaker local labour market conditions may act to discourage worker who may have otherwise be active in the employment market.

Comparing results across the groups, indicates that there are similar outcomes between the unemployed and sub-unemployed, however results for the under-employed differ across a number of factors. Higher education does more to reduce the likelihood of being unemployed or a discouraged worker than being involuntary part-time employed, although the variable is significant for the three categories. Factors commonly associated with labour market disadvantage, including Indigenous status, disability and having parents born overseas and not in paid employment, are more

important determinants for the unemployed and sub-unemployed than for involuntary part-time workers. Females are more likely than males to be amongst the sub-unemployed and involuntary part-time workers (this could be explained by the dominance of part-time work in traditional female industries and occupations), they are less likely to be unemployed, which may be related to lower rates of labour force participation. The presence of dependent children is most strongly associated with involuntary part-time employment and sub-unemployment, although being in a single parent family is also associated with unemployment. Movers are more likely to be unemployed or in the sub-unemployed, this variable is not significant for the involuntary part-time unemployed. As we would expect the weaker the outside competition for jobs in the local labour market (measured by LMR self-containment) the less likely a person is to be involuntary part-time unemployed. This variable is not significant for the sub-unemployed and unemployed. Social networks are significant and positive for all three categories and the coefficient is of a similar magnitude. The share of jobs which are part-time is a significant and positive predictor of involuntary part-time work suggesting that the types of jobs that are available in a local area and that are accessible may be significant. The employment rate in the local labour market is positive, significant and of a similar magnitude for all three categories.

5. Discussion and Conclusion

We cast the research conducted in this paper in terms of a conceptual model that considers labour underutilisation as a function of a broad range of factors that include individual characteristics, family and personal circumstances and characteristics of local labour markets. In undertaking the analysis we recognise that the outcomes and patterns identified have several limitations. It is important to note that in undertaking the analysis presented in this paper we have not sought to identify causal relationships. Rather we have simply identified associations that exist between a range of independent variables net of other factors in the model and the dependent variable of interest, namely labour underutilisation. Further analysis using longitudinal data will provide some insight into these issues and will be the subject of further analysis. Also we have not been able to model differential regional impacts of policy or regional variations in vacancy rate.

With these limitations in mind the analysis provides some interesting findings. Not unexpectedly the individual level factors often associated with labour market disadvantage were largely important in the model of underutilisation presented here and do reflect the findings from a range of existing studies. As we expected, low education hampered the ability of individuals to be employed adequately (not underutilised in some way) illustrating the important returns to investment in education discussed by researchers working from a human capital theory perspective. Other individual level factors such as racial background or English proficiency were also important, especially in terms of the most extreme forms of underutilisation and may be associated with lower levels of necessary skills (in the case of language proficiency) or discrimination. The results for the variables accounting for the presence of dependent children are interesting. In both cases the results suggest that the presence of dependent children may act as a constraint on labour market participation. McQuaid and Lindsay (2005) identify that the presence of caring responsibilities may be an important impediment to employability. Aspects of a respondent's family background were also seen as important, reflecting theories around role model effects and intergenerational transmission of disadvantage. Outcomes relating to residential mobility reflect findings that net of other factors the

moving may not increase a person's chances of finding employment, although in a cross-sectional analysis the sequence of events is difficult to determine (Bill and Mitchell, 2006). Over and above these factors, the role of local labour markets should be highlighted. Although some existing research tends to ignore the impact of these demand-side factors, focusing only on the narrower supply-side or individual influences, we have illustrated that there is a small but important local labour market dimension to understanding individual level outcomes.

The policy message from this paper is that a mix of both may well be the most appropriate course of action. The empirical example discussed here clearly shows that if governments are to pursue policy to addresses questions of labour market disadvantage in metropolitan regions then simply focusing on one facet of the problem will likely be sub-optimal. In several industrialised countries the emphasis of government policy on combating labour market disadvantage is to improve personal employment prospects by introducing schemes which focus on the employment assets of the individual job seeker that are increasingly neo-liberal in their approach. However, improving the employability of individuals through increasing their employability assets or helping them overcome other personal constraints to adequate employment is, in itself insufficient and to a large extent simply reshuffles the existing queue for the available jobs. A more sustainable and successful approach is likely to include also improving the available job opportunities. Turok and Webster (1998) and Sunley et al. (2006) argue that employment creation that is targeted at the local level (i.e. place based) is the missing link in much contemporary labour market policy. Similar arguments have been put forward by Australian researchers including Mitchell and Watts (1997) and Burgess (1997) who suggest that buffer stock employment schemes or public sector employment schemes are required to appropriately address disadvantage in the labour market. A significant question also relates to the correct balance of jobs. Ensuring that sufficient full-time jobs are created will be important. Additionally local labour markets are generally not entirely self-contained. As was noted here some potential workers may be bumped down by the in-movement of commuters into a particular local labour market (Gordon 1999, Bailey and Turok 2000, Bill et al. 2005) and hence this is also an important issue in understanding potential labour market outcomes and adjustment in metropolitan labour markets. Clearly while the exact mix between people base polices and place based policies will require careful consideration and further understanding there can be little debate on the need to consider both. Empirical research such as that presented in this paper will be an important start to this understanding.

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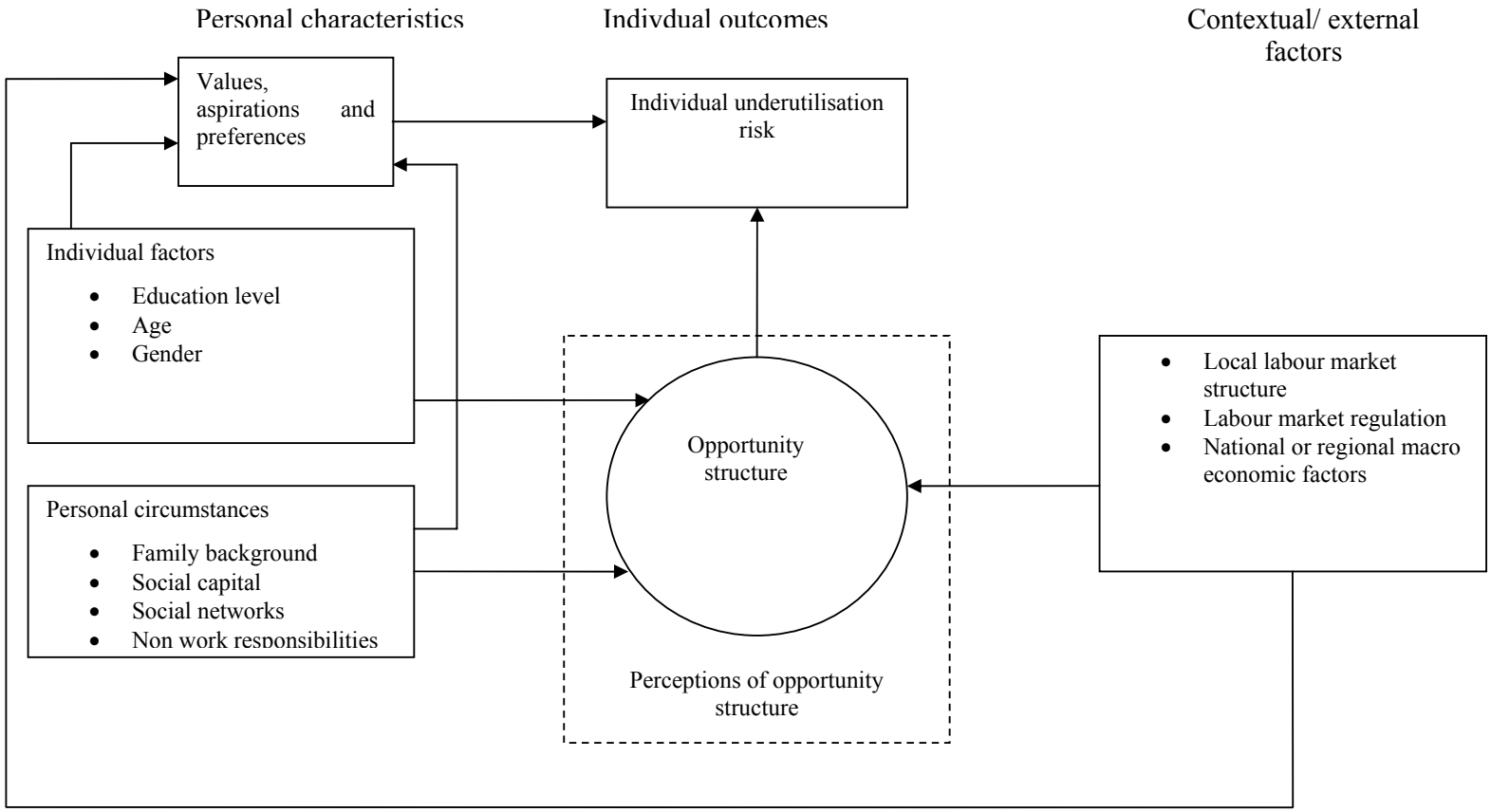
Figure 1: Heuristic model of individual underutilisation risk



Adapted from Galster and Killen (1995)

Table 1: Labour market outcomes, descriptive analysis

	Adequately employed	Involuntarily part-time	Unemployed	Sub-unemployed
AGE25_44	79.8	7.4	4.5	8.6
AGE45-64	82.2	5.3	4.4	8.1
MIN_ED	68.9	9.0	8.9	13.2
GENDER	71.2	11.0	4.5	13.3
ATSI	56.4	8.4	18.3	16.9
ENG_PROF	58.2	5.5	18.7	17.6
DISABLE	68.8	9.2	7.8	14.2
MOVED	74.0	7.4	8.3	10.2
COUPLE_KIDS	76.9	8.4	4.1	10.6
SINGLE_KIDS	47.1	16.5	9.2	27.2
PAR_UN	62.4	6.3	12.1	19.1
PAR_OS	71.2	9.5	8.9	10.2
SOC_NET	-0.06	0.14	0.38	0.28
EMP_RATE	93.8	93.7	93.4	93.4
LMR_PT	31.7	32.2	31.6	31.9
LOC_EMP	58.3	58.9	59.0	60.7

Table 2 Multinomial logit results, individual level predictors and disaggregated underutilisation

	involuntary part time			unemployed			Sub-unemployed		
	β	Robust std error	Relative risk	B	Robust std error	Relative risk	β	Robust std error	Relative risk
AGE25_44 (1=person aged between 25 and 44, 0 otherwise)	-1.174**	0.136	0.309	-1.116**	0.139	0.328	-0.568*	0.203	0.566
AGE45-64 (1=person aged between 45 and 64, 0 otherwise)	-1.489**	0.169	0.226	-1.192**	0.169	0.304	-0.340*	0.178	0.712
MIN_ED (1 =person has the minimum level of education only, 0 otherwise)	0.308*	0.142	1.361	0.853**	0.135	2.346	0.639**	0.150	1.895
GENDER (1=female)	0.863**	0.100	2.371	-0.278*	0.103	0.757	1.323*	0.124	3.753
ATSI (1=ATSI background)	0.120	0.416	1.127	1.211**	0.329	3.358	0.709	0.468	2.032
ENG_PROF (1= person has poor self reported English proficiency)	0.080	0.446	1.083	1.685**	0.270	5.390	1.073**	0.312	2.925
DISABLE (1= person has self reported disability)	0.430**	0.158	1.538	0.525**	0.150	1.690	0.874**	0.132	2.396
MOVED (1= respondent had moved in the past 12 months)	-0.280**	0.139	0.756	0.479**	0.106	1.615	0.371*	0.134	1.449
CONSTANT	-1.989**	0.162		-2.186**	0.134		-3.567*	0.190	

+ significant at 10%; * significant at 5%; ** significant at 1%

Log Pseudo Likelihood: -3754.24

Count R2: 0.78

BIC: -38347.963

Table 3: Multinomial logit results, individual level predictors, personal circumstances and disaggregated underutilisation

	involuntary part time			unemployed			sub-unemployed		
	β	Robust se	Relative risk	β	Robust se	Relative risk	β	Robust se	Relative risk
AGE25_44 (1=person aged between 25 and 44, 0 otherwise)	-1.120**	0.138	0.326	-0.999**	0.158	0.368	-0.462*	0.204	0.630
AGE45-64 (1=person aged between 45 and 64, 0 otherwise)	-1.417**	0.175	0.243	-1.002**	0.187	0.367	-0.208	0.187	0.812
MIN_ED (1 =person has the minimum level of education only, 0 otherwise)	0.301*	0.145	1.352	0.832**	0.143	2.297	0.650**	0.145	1.915
GENDER (1=female)	0.881**	0.101	2.414	-0.231*	0.102	0.793	1.352**	0.125	3.864
ATSI (1=ATSI background)	0.155	0.439	1.167	1.299**	0.320	3.665	0.693	0.474	1.999
ENG_PROF (1= person has poor self reported English proficiency)	-0.153	0.466	0.858	1.099**	0.266	3.002	0.644*	0.300	1.903
DISABLE (1= person has self reported disability)	0.414*	0.161	1.512	0.542**	0.154	1.720	0.870**	0.139	2.386
MOVED (1= respondent had moved in the past 12 months)	-0.253*	0.142	0.777	0.596**	0.110	1.815	0.414*	0.134	1.514
COUPLE_KIDS (1= Couple family with dependent children, 0 otherwise)	0.325*	0.129	1.384	-0.145	0.189	0.865	0.896**	0.106	2.449
SINGLE_KIDS (1= Single parent with dependent children, 0 otherwise)	1.053**	0.213	2.866	0.783*	0.287	2.187	1.703**	0.159	5.490
PAR_UN (1= Parents not in paid employment when respondent child, 0 otherwise)	-0.081	0.314	0.922	0.830*	0.337	2.293	0.911**	0.263	2.488
PAR_OS (1=Parents born overseas, 0 otherwise)	0.274*	0.123	1.316	0.825**	0.140	2.281	0.538**	0.110	1.712
SOC_NET	-0.196**	0.043	0.822	-0.347**	0.071	0.707	-0.235**	0.051	0.791
CONSTANT	-2.137*	0.166		-2.726**	0.174		-3.910**	0.211	

+ significant at 10%; * significant at 5%; ** significant at 1%
Log Pseudo Likelihood: -3684.781
Count R2: 0.78
BIC: -38409.571

Table 4 Multinomial logit results, individual level predictors, personal circumstances, local labour market effects and disaggregated underutilisation

	involuntary part time			unemployed			sub-unemployed		
	β	Robust se	Relative risk	β	Robust se	Relative risk	β	Robust se	Relative risk
AGE25_44 (1=person aged between 25 and 44, 0 otherwise)	-1.109**	0.138	0.330	-0.993**	0.158	0.370	-0.450*	0.204	0.638
AGE45-64 (1=person aged between 45 and 64, 0 otherwise)	-1.427**	0.175	0.240	-0.982**	0.190	0.374	-0.187	0.188	0.830
MIN_ED (1 =person has the minimum level of education only, 0 otherwise)	0.314*	0.130	1.368	0.769**	0.145	2.158	0.590**	0.148	1.803
GENDER (1=female)	0.902**	0.104	2.464	-0.215*	0.102	0.807	1.374**	0.127	3.950
ATSI (1=ATSI background)	0.005	0.461	1.005	1.231**	0.320	3.424	0.607	0.452	1.835
ENG_PROF (1= person has poor self reported English proficiency)	-0.028	0.477	0.972	1.128**	0.259	3.089	0.701*	0.305	2.016
DISABLE (1= person has self reported disability)	0.403*	0.165	1.496	0.538**	0.154	1.712	0.870**	0.140	2.387
MOVED (1= respondent had moved in the past 12 months)	-0.231	0.142	0.794	0.601**	0.110	1.824	0.416*	0.132	1.516
COUPLE_KIDS (1= Couple family with dependent children, 0 otherwise)	0.338*	0.131	1.402	-0.167	0.194	0.846	0.877**	0.106	2.403
SINGLE_KIDS (1= Single parent with dependent children, 0 otherwise)	1.070**	0.214	2.915	0.769*	0.290	2.157	1.680**	0.161	5.368
PAR_UN (1= Parents not in paid employment when respondent child, 0 otherwise)	-0.106	0.316	0.900	0.816*	0.339	2.262	0.892**	0.265	2.439
PAR_OS (1=Parents born overseas, 0 otherwise)	0.356*	0.119	1.427	0.865**	0.141	2.374	0.595**	0.114	1.813
SOC_NET	-0.209*	0.042	0.811	-0.347**	0.071	0.707	-0.239**	0.051	0.787
EMP_RATE (local employment rate)	-0.019	0.028	0.981	-0.082*	0.026	0.921	-0.075*	0.030	0.928
LMR_PT (% of local jobs that are part-time)	0.108**	0.018	1.114	0.007	0.027	1.007	0.031	0.026	1.031
LOC_EMP (Local employment self containment)	-0.007*	0.003	0.993	0.002	0.004	1.002	0.001	0.004	1.001
CONSTANT	-3.474	2.611		4.629	2.678		2.046	3.170	

+ significant at 10%; * significant at 5%; ** significant at 1%
Log Pseudo Likelihood: -3663.06
Count R2: 0.78
BIC: -38375.704

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