On the Risk of Unemployment: A Comparative Assessment of the Labour Market Success of Migrants in Australia

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Abstract
This paper analyses the 'risk' of unemployment of male immigrants to Australia relative to the native born using wave 1 of HILDA. It exploits the more detailed information in HILDA on individual and parental characteristics that affect labour market outcomes than has been used in previous studies. The paper also benchmarks the results obtained with the HILDA data (referring to 2001) by comparing it with results from the 1990 Income Distribution Survey data. This approach permits analyses both of changes over time between 1990 and 2001, and of the robustness of results across model specifications based on limited and extensive data. The results show there is a clear disadvantage in the probability of finding employment for migrants with similar characteristics of a native born Australian in both time periods. Migrant relative disadvantage has not diminished in spite of greater emphasis on skilled migration in recent years. The extended HILDA model results show that the effects of variables commonly used previously are quite robust, but several additional correlates of individual unemployment are identified for migrant specific as well as general characteristics.

1. Introduction
Australia has one of the highest proportion of people born overseas among major developed countries,[1] and so there is enduring research interest in the process through which immigrants are assimilated in the Australian labour market. One important feature of this research focus has been to analyze the relative success that migrants achieve on various labour market indicators in comparison to the native born population. The key indicators of the labour market outcomes of migrants studied have been their participation in the labor force (Ackland and Williams, 1992), current employment status (Miller and Neo, 1997), earnings and wage adjustments (Beggs and Chapman, 1988), the match between migrants' jobs and their

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This paper has benefited substantially from the detailed comments of the Editors, two anonymous referees and of Raja Junankar, who was a discussant on an earlier version of this paper presented at the Australian Labour Market Research Workshop (ALMR) in December 2002 at the University of Queensland. I acknowledge the financial support of the Commonwealth Department of Employment and Workplace Relations for the 2002 ALMR presentation. I have also benefited from comments received in seminar presentations at The Australian National University. I thank in particular Deborah Cobb-Clark and Bruce Chapman for their detailed comments. The usual disclaimer applies.
[1] For June 2002 this proportion is 23 per cent, which is equal highest with New Zealand among countries with major migration programs. See, ABS, *Migration 2002-03* (Catalogue 3412, p.85-6).

skills and qualifications (Evans and Kelley, 1986), and occupational status (Borooah and Mangan, 2002).

This paper focuses on only one of these commonly used measures of migrant labour market success – the relative risk faced by a specific group of migrants of being unemployed at a given point of time in comparison to the native born population, as well as other migrant groups. While this is only a single dimension of labour market success, employment status is clearly a key indicator of assimilation; and from the migrant's own perspective, perhaps the signal indicator of their aspirations in their new setting. As Australia's migration policy is increasingly being channeled into skilled based selection streams, relying on indicators that value potential Australian labour market skills, there is continuing research interest on the factors that explain the relative success of migrants in obtaining and holding jobs relative to the native born. This research area also fits into the wider theme of the empirical literature on the mechanisms and measurements of 'statistical discrimination', as pioneered in Arrow (1973). There is also a theoretical perspective to this interest because the empirical analyses provide a setting to test among competing versions of the theories of job search, human capital acquisition, and skill transferability when applied across borders (Borjas, 1999).

There is already a large literature on the relative labour market success of migrants in Australia, with the early contributions summarized in depth in Wooden (1994) and some later contributions summarized in Miller and Neo (1997). In the earlier literature, as exemplified by Inglis and Stromback (1986), the standard approach was to estimate either multinomial or binary dependent variable models to specify the relationship between the probability of a person being unemployed and their individual and family level socio-economic characteristics, including country of birth. These explanatory variables are customarily labeled the 'correlates' of unemployment at an individual level.

One can interpret the analysis of the correlates of unemployment as a way to specify probability models that explain how the aggregate rate of unemployment is distributed over specific sub-groups or segments of the labour force, distinguished by various socio-economic characteristics. Even in periods of high overall employment the relative incidence of unemployment in specific sub-groups can differ dramatically. This is highlighted by the recent focus on the increase in both jobless and multiple-job households in Australia (Dawkins, *et al*., 2002), as in other developed countries. A better understanding of how and why individual and sub-group level characteristics are correlated with the probability of being unemployed provides clearer insights on how the Australian labour market functions in evaluating employment prospects of specific individuals. Analysis of this kind can assist in the design of labour market policies to combat immigrant (and overall) unemployment more effectively.

Comparative analysis of the risk of unemployment of migrants can be either in reference to the native born population, or within migrants groups themselves distinguished along several characteristics. Most Australian research has been of the former kind because, until the recent release of the Longitudinal Survey of Immigrants to Australia (LSIA), there were few large scale representative surveys of the migrant population. The recent

availability of data from the two cohorts of LSIA has opened up a new dimension on migrant labour market research with a representative and very detailed survey that also has a longitudinal format.[2] There are now several valuable studies that look at the labour market outcomes of migrants during the early settlement period covered by LSIA.[3] Though these studies exploit the richness and the longitudinal nature of LSIA to provide a deeper analysis of the factors associated with the labour market success of migrants, there are two important limitations of the analyses based on LSIA and related migrants-only data sets.

Firstly, they provide a rather limited time window for evaluating migrant labour market success because such surveys tend to be targeted to migrants who arrived over a specific time period. This constraint unfortunately is severely binding for LSIA. Coupled with a short follow up period, LSIA offers a limited time frame to assess the labour market assimilation of recent migrants to Australia.[4]

Secondly, the comparisons that can only be made across migrant groups and time cohorts offer a limited perspective on assimilation. A direct comparison of the labour market performance of migrants, relative to the native born, is not feasible from these surveys. But such a comparison lies at the heart of the process of migrant assimilation and catch up that has been of interest in the international literature. Borjas (1999) discusses alternative interpretations of immigrant 'assimilation' and the importance of clearly specifying what the base group is in the comparative analysis of the labour market outcomes of immigrants. A direct comparison with the native born is also critical from the broader perspective of the literature on defining and measuring 'discrimination' in the market place for individuals with different racial or gender profiles, in the tradition of the decomposition studies following Oaxaca (1973).[5]

From the perspective of comparisons with the native born, a key research question of interest in the Australian context is: Are equivalent skills and labour market experience for migrants who come from a vast range of countries and backgrounds valued differently in the Australian labour market than for the native born? If so, for how long does this 'immigrant' tag stick in terms of employment status? Answers to such questions require direct comparison of the contemporary outcomes of the native born and migrant sub-groups, with adequate data coverage over the time period of residence for migrants. This paper takes the approach of making direct comparisons between migrants and the native born. While it is in the mould

[2] Some previous research of this nature using migrants-only data was carried out using the ABS irregular series on *Labour Force Status and Other Characteristics of Migrants* and the one-off 1989 survey carried out by the Office of Multicultural Affairs. See, references in Wooden (1994).
[3] Examples are Cobb-Clark and Chapman (1999), Cobb-Clark (2000), VandenHeuevel and Wooden (2000), Richardson, *et al*. (2001) and Junankar, Paul and Yasmeen (2002).
[4] The LSIA sample consists only of migrants who arrived in Australia between September 1999 - August 2000 (Cohort 2) and between September 1993 - August 1995 (Cohort 1). The longitudinal nature of LSIA is also very limited. The first cohort was interviewed in three waves between six months and forty two months after arrival; and there has been no subsequent follow up with this population. The second cohort was followed up for an even shorter period of up to 18 months since arrival. See, Richardson, *et al*. (2001) for a description of the LSIA survey and the main summary findings on the labour market outcomes for these two cohorts of recent migrants.
[5] The framework of discrimination as applied to migrants in Australia has been studied in Foster, *et al*. (1991), Miller and Neo (1997) and Junankar, Paul and Yasmeen (2002).

of the earlier studies by Inglis and Stromback (1986) and Miller and Neo (1997), it offers two important points of departure.

Firstly, it exploits the richness of the *Household, Income and Labour Dynamics in Australia (HILDA) Survey* data to expand upon the model specifications that have been conventionally used in earlier studies to compare the labour market success of migrants and the native born. Secondly, it provides a repeated cross-section framework for assessing the relative employment success of migrants with a common model structure over two time periods, 2001 (using HILDA) and 1990 (using the ABS Income Distribution Survey, IDS 1990).[6] The scope and level of details of the data collected in these two surveys are quite different. One can exploit the common elements and the differences in data coverage in these two surveys to make two types of comparisons:

(1) comparison over time between 1990 and 2001 using a basic model specification that can be supported by both data sets;[7]
(2) comparison in 2001 between a basic model specification and a richer one that is possible with the extra information in HILDA.

It turns out that the macro-economic setting of aggregate unemployment in Australia during the period of the IDS 1990 and HILDA wave 1 surveys was not that different in levels of unemployment, but very different in terms of business cycle trends. In the September to December 1990 period of the IDS survey the average monthly unemployment rate was 7.5 per cent. During the HILDA wave 1 period, August 2001 to January 2002, the average monthly unemployment rate was about one percentage point lower (6.7 per cent).[8] However the IDS 1990 survey period was the start of the deep recession of 1991/92 and there was a substantial trend in the aggregate unemployment rate within the IDS 1990 survey period and in the months immediately afterwards.[9]

In addition to the different business cycle setting, comparison (1) is further relevant in the Australian context because of the deregulation and structural changes in the labour market in the 1990's which has a bearing on how an individual's skills and employability qualities are assessed. Also, there has been a changing mix in the inflow of new migrants in recent years, as more emphasis has been placed on the skilled migration stream.[10] The

[6] The full reference to IDS 1990 is the ABS *Survey on Income and Housing Costs and Amenities 1989/90*.
[7] Doing comparative analyses from two surveys conducted by two different organizations can lead to various problems of interpretation when there are differences in the coverage, in the nuances of the questions asked and in the definitions of variables created in the two surveys. Fortunately, the HILDA Project Team has reported it has made extensive use of ABS survey practice and forms and there are only minor differences in the coverage of the population. (See, the Melbourne Institute, *HILDA Survey Annual Report 2002*, p.10). For the main question addressed in this paper – the labour market status of survey respondents – the HILDA survey has followed the ABS conventions based on ABS, *Labour Statistics*: *Concepts, Sources and Methods* (ABS Catalogue 6102.0, 2001).
[8] Average of monthly unemployment rates from the ABS *Labour Force Survey* (Catalogue 6203, table 1, various issues). Unemployment figures quoted in the next footnote are also from this source.
[9] Aggregate unemployment rates trended up sharply from October 1990 (7.2 per cent) reaching 8.1 in December 1990, 9.1 in January 1991, and 9.9 per cent by April 1991.
[10] In 1990/91 about 44 per cent of the migration program intake entered under the Skilled stream. This proportion increased to 58 per cent in 2001/2002 (DIMIA, *Immigration Update*, various issues). It should be remembered that the characteristics of the total stock of migrants at these two time periods would have changed much more slowly than the dramatic changes in the characteristics of the annual inflows.

characteristics of Australia's migrant stock is slowly changing due to relatively large inflows of migrants from non-traditional source countries because of the liberalization in Australia's immigration policies since the mid 1980's. So it is important to be able to find ways to define and then compare 'like with like' from the migrant and native born sub-populations at different points in time. Previous studies have not analysed the risk of migrant unemployment relative to the native born in the post-1990's setting.[11]

Comparison (2) is valuable for uncovering new correlates of migrant unemployment and validating the specification of the conventionally used models. It is useful to check how robust the parameter estimates of the conventional models are to excluded variables, and indeed to test whether key variables identified in the traditional model specifications are important in themselves, or because they are proxies for other more fundamental variables on which data are not generally available.

In what follows, section 2 briefly describes and provides a justification for the use of these two data sets for the question at hand. It highlights the nature of the extra information in HILDA that could be useful in assessing the probability of unemployment of migrants, relative to the native born. It also gives a summary of how the estimation sample is constructed for both surveys, and presents summary statistics for the main variables. Section 3 presents the results for the comparison between 1990 and 2001 with a common Basic model structure supported by both data sets. This Basic model is motivated by the results from previous studies on the labour market success of migrants in Australia which have been based primarily on a limited set of variables collected in the Australian census. Section 4 briefly motivates the specification of the more detailed Extended model, and presents in fuller form the results from these extended specifications possible only with the HILDA sample. These results are compared with those of the Base specification of section 3 to gauge the robustness of the conventional model results. The last section provides a summary and some additional discussion of the results, including limitations of the approach adopted, and some ways in which it can be extended in future research.

2. Data and Samples

Most previous studies on the labour market success of migrants relative to the native born in Australia are based on the public release one per cent unit record data from the Census of Population and Housing. The Australian census collects a fixed set of information on birth place and year of arrival for migrants which together with a basic range of socioeconomic data for the entire sample (i.e., schooling and qualification, demographic characteristics, geographic location and labour force status, etc.) provide a periodic data set to analyse the correlates of successful labour market outcomes for migrants relative to the native born. The Australian census has been recognized to contain a fuller set of information on international migrants than is customary in other countries (Hugo, 1994). Nevertheless, its information set is still very limited from the perspective of modern labour economics with its focus on the high degree of individual heterogeneity observed in labour market choices and outcomes for individuals who may share some basic characteristics.

[11]The most recent Australian study on the risk of migrant unemployment relative to the native born is Miller and Neo (1997) using 1991 Census data.

In the Australian context, the HILDA survey fills this gap adequately because of the substantially more detailed and very extensive personal characteristics information it contains. This includes retrospective life cycle information about individual respondents, together with information on characteristics and some labour market history of the parents as well, more detailed data on years of schooling and higher qualifications, and more dis-aggregated categories for country of birth of migrants. It also includes self-assessed health status which can have significant inter-relationships with labour market outcomes. Although the sample size of individuals in HILDA is substantially less than in the one per cent census sample, it offers a richer variety of model specifications. It is of considerable interest then to verify how robust are the results from previous studies on migrants' risk of unemployment using the limited set of information from the census in comparison with model specifications possible with the HILDA data.

This paper is based only on wave 1 data so the longitudinal nature of HILDA is not exploited. Nevertheless the richness of coverage on employment and other labour market outcomes in the first wave and the depth of data on other aspects of an individual's characteristics makes it a comprehensive source of information for assessing the employment outcomes of different groups in the Australian community.

The Income Distribution Surveys (IDS) of ABS, which are large nationally representative household surveys, are irregular extensions of the Labour Force Survey. Even though IDS 1990 does not have as much detailed information on migrant characteristics as in the census, the former has been used as the appropriate comparator with HILDA because these two surveys share a similar coverage of the reference population, have a similar clustered sample design and employ similar concepts and definitions in assessing labour force status for the unemployed and not in labour force categories.[12]

The respondent sample in wave 1 HILDA consists of 13,969 individuals aged 15 or above from 7,682 households. Table 1 gives the distribution of the total number of persons in the HILDA sample by current employment status, and by an aggregated country of birth classification that classifies migrants into those from 'main English speaking countries' and others.[13] In the HILDA sample there are slightly fewer migrants in proportion to ABS estimates for the Australian population in general.[14] A total of 3,556 persons aged 15 or over who were born overseas were enumerated in the HILDA sample. The equivalent number for Australian born persons is 10,431. The IDS 1990 is a larger survey that counted over 32,000 individuals aged 15 or more in about 18,000 income units (families).

[12] The labour force status definitions are not exactly equivalent in HILDA and IDS 1990 but more similar than with the census. The additional details collected in the IDS and HILDA about job search activities and about people waiting to start new jobs lead to a more nuanced classification of the labour force status of those who are not currently employed. This classification is done less precisely from the census data that uses a shortened version of these questions, and is furthermore different in that it is self-administered. See, ABS (2001, p. 66-67 and 73) for a discussion of the various ABS conventions and questionnaire modules used for labour force status determination and their implication for unemployment rate estimates.

[13] The main English speaking countries are identified as: the United Kingdom, Ireland, New Zealand, Canada, the USA and South Africa. Note this classification is not based on an individual migrant's English language proficiency. It is only a way of grouping country of birth categories.

[14] Table 3 in the Melbourne Institute's *HILDA Survey Annual Report 2002* makes an explicit comparison of the representativeness of the HILDA sample with respect to ABS estimates for the general population.

Table 1 Distribution of HILDA Individual Sample by Gender, Labour Force Status and Country of Birth

	Australian Born	*Migrants*	*Total*	*ESB* Migrants*	*NESB* Migrants*
Male					
Employed	3,471	1,069	4,540	504	565
Unemployed	242	109	351	40	69
Not in labour force	1,190	541	1,731	225	316
Total	4,903	1,719	6,622	769	950
Female					
Employed	3,112	873	3,985	390	483
Unemployed	186	72	258	29	43
Not in labour force	2,212	892	3,104	337	555
Total	5,510	1,837	7,347	756	1,081
Grand Total	10,413	3,556	13,969	1,525	2,031

* ESB and NESB indicate migrants from English speaking and non-English speaking backgrounds.

The current labour force status of individuals at the time of the surveys is recorded in several categories. These were re-grouped into three states: not in the labour force, employed, and unemployed. Current employment is established on the basis of work within the past week; being in the labour force is established on the basis of current employment or actively looking for work in the last four weeks. The regression models in this paper are run on the sub-sample of the currently employed or unemployed, ignoring those not in the labour force. This gives an assessment of the probability of being unemployed, conditional on being in the labour force.[15]

The final sample for the empirical analysis in this paper is limited to male respondents aged between 15 and 64, who are currently in the labour force and not in full-time education. It is customary to treat the labour supply of men and women separately, and the original intention was to repeat the analysis separately for women. Unfortunately in the HILDA survey the equivalent sample of women (i.e. aged 15 to 64 and not in fulltime education) results in only 61 migrant women reporting to be unemployed. The cell sizes become even smaller when one breaks up the unemployed female migrants into the conventional distinction of being from an English speaking and non-English speaking background. While the proportion of unemployed persons in any representative sample of households will always be small, it is still necessary to have a reasonable absolute number of cases in the relevant categories of interest for reliable regression results. For this reason the comparative analysis of the probability of unemployment for native born and migrants is carried out only for the male sub-

[15] Imposing such a structure on the data means the comparative analysis of the labour market success of migrants and the native born can be carried out within a simple binary dependent variable model. Most previous studies have also mainly used a binary choice framework to model unemployment/employment. About two–thirds of the studies tabulated in the reviews by Wooden (1994) and Miller and Neo (1997) use binary specifications only. While it would be useful to extend the analysis to a multi-nominal choice setting that also includes comparative analysis of the decision not to be in the labour force, as in Wooden (1991), the binary structure of employed/unemployed is not overtly restrictive when considering the labour market outcomes for men only, as is the case in this paper.

sample.[16] Also the age and educational status restrictions are imposed since variation in employment status for the elderly, who are likely to be formally retired but may still do odd jobs, and for the very young who are still studying full time, is not of much interest in a migrant *vs*. native born comparison.

Table 2 Sample Distribution of Employment Status (for Males aged 15-64)*

	Australian Born	*Migrants*	*Total*	*ESB Migrants*	*NESB Migrants*
IDS 1990					
Employed	7,329	2,686	10,015	1,346	1,340
Unemployed	674	299	973	127	172
Total	8,003	2,985	10,998	1,473	1,512
Percentage of total	72.8	27.1	100	13.4	13.7
Sample Unemployment Rate					
Un-weighted %	8.4	10.0	8.8	8.6	11.4
Weighted %	8.0	9.9	8.6	8.5	11.0
HILDA Wave 1 (2001)					
Employed	3,237	1,028	4,265	492	536
Unemployed	217	101	318	37	64
Total	3,454	1,129	4,583	529	600
Percentage of total	75.4	24.6	100	11.5	13.1
Sample Unemployment Rate					
Un-weighted %	6.3	8.9	6.9	7.0	10.7
Weighted %	6.2	8.5	6.8	7.0	10.3

* Who are not in full-time education.

The final breakdown of the restricted sample of men by their employed/unemployed status for both HILDA wave 1 and IDS 1990 is indicated in table 2. HILDA wave 1 has 4,583 males in the labour force of which 1,129 (24.6 per cent) are migrants. The IDS 1990 sample has 10,998 males, with a slightly higher proportion of migrants (at 27.1 per cent). The sample unemployment rate (weighted) is 8.6 per cent in the IDS sample and 6.8 per cent in HILDA. This difference does not exactly mirror the actual unemployment levels for men during the latter half of 1990 and 2001, as measured from the ABS Monthly Labour Force Survey. The IDS sample estimate of unemployment in table 2 is higher than the corresponding estimates from the monthly surveys.[17] Table 2 also clearly indicates that

[16] Small cell size problems also occur for the male sample in HILDA where, in the restricted sample as described above, a total of 101 migrants report being unemployed. Nevertheless, there are more than 35 unemployed individuals in each of the main categories of English and non-English speaking backgrounds.

[17] The weighted male unemployment rate of 6.8 per cent in the HILDA wave 1 sample of table 2 is consistent with the monthly average male unemployment rate during the wave 1 survey period. For the IDS survey period, the average monthly unemployment rate from the Labour Force Survey is 7.5 per cent, a discrepancy of 1.1 percentage points with the weighed sample estimate in table 2. Some of this discrepancy may be due to the slightly different questionnaires used in the IDS and Labour Force Surveys. See, ABS (2001, p.66-67). But the more likely explanation is that the discrepancy reflects higher sampling error in the period of the emerging recession of 1991, with unemployment rates trending sharply up over the months of the IDS survey period, as noted in footnote 9. We do not observe the actual monthly interview schedule for the IDS sample and this may not have been evenly distributed. One should also note that the 8.6 per cent average unemployment rate estimated from the IDS sample is considerably below the Labour Force Survey estimate of 9.3 per cent male unemployment rate in January 1991, the month immediately after the end of the 1990 IDS survey period.

migrant unemployment rates are consistently higher than for the native born, and that there is a further disadvantage for non-English speaking background (NESB) migrants whose unemployment rates are 2.5 to 3.7 percentage points higher.

3. Base Model: Specifications and Results

Previous studies on the risk of unemployment in Australia based on the census and other household surveys have used a standard set of explanatory variables to model the probability of unemployment (henceforth, PBU). These variables include general individual characteristics, such as age, educational level, marital status, regional location, and family relationships and structure. The main migrant-specific characteristics of interests have been country of birth, overseas qualification, period of residence in Australia and English proficiency. The general finding from these studies is that for all individuals the PBU is generally *decreased* by higher educational attainment, older age and more previous labour market experience, being currently married, and living in urban areas. The two most important migrant specific variables that tend to decrease the PBU are longer period of residence and better English proficiency (Miller and Neo, 1997).

Several further refinements to this general story have been offered. One key refinement is that the period of residence effect is mostly observed for NESB migrants only (Wooden and Robertson, 1989). For ESB migrants, even if they face an initial disadvantage in employment prospects this is not as clearly mitigated over a longer period of residence as for NESB migrants. Similarly, it has been found that the effect of years of schooling may also not be uniform across migrant groups. Additional years of schooling often leads to a smaller reduction in the PBU for NESB migrants (Beggs and Chapman, 1990), indicating that human capital acquired in non-English speaking countries may be less internationally transferable to Australia and to other English speaking destination countries.

The Base model specification chosen for this study replicates these earlier findings with the HILDA data set to compare how the relative employment disadvantage of migrants has changed in the 1990 to 2001 period. The Base model is specified in terms of explanatory variables that are common to both the IDS 1990 and HILDA data sets. Even though some variables are measured in more detail in HILDA, the Base model is specified only in terms of the common details available in the IDS in order to determine how the regression parameters estimated may have changed over time for this common set of parameters. One limitation imposed by this structure is that the variable definitions of the IDS 1990 do not provide individual country names for country of birth. This implies that the important distinction into ESB and NESB migrants is only approximate for the 1990 Base model specification.[18]

[18] The assignment into the ESB and NESB migrant groups from the 1990 IDS country / region of birth classification were made as follows:

ESB category :	*NESB category :*
United Kingdom	Italy
N. America	Other Europe
Oceania (assuming this group is mainly from New Zealand)	Africa
	Asia

Table 3 gives a summary of the variables created for the Basic model specification for the entire sample of men, as well as by sub-groups of Australian born (AB), and ESB and NESB migrants for both data sets. The variable PLFEXN measures years of potential labour market experience of all individuals.[19] A similar variable when applied to the Australian setting (A_PLFEXN) has the same value as PLFEXN for the native born population; and for migrants, A_PLFEXN is the minimum of years in Australia, or PLFEXN. The regional distribution of the sample has been captured along two different dimensions - state/territory of residence interacted with capital city location. The demographic characteristics are represented by dummies for various martial status categories, the relationship of the individual to the reference person of the family unit and by the presence of young children (aged 0-4) in the household.

For migrants their period of residence is calculated on the basis of dummy variables for different lengths of time since arrival in Australia. This way of defining period of residence relative to date of arrival, rather than the actual calendar period of arrival is necessary so that a common structure could be imposed for the two different time periods of the IDS 1990 and HILDA wave 1 surveys.[20]

Table 3 indicates that there are major differences in the average characteristics of the three sub-groups, AB, ESB and NESB. In both data sets, compared to the AB group, the migrant groups have more years of education, are slightly older, a higher percentage are currently married and live in capital city areas. The contrast in the last category is particularly striking: in both data sets the proportion of AB men not living in capital city areas (which ranges from 41 to 47 per cent) is more than double the proportion of migrants not living in capital city areas (at 19 to 21 per cent). While there are differences on other characteristics also, it is important to keep the above four in mind because in each case (more educated, higher age, more urban based, and higher proportion married) the expected effect is to *reduce* the PBU. So the observed higher levels of unemployment among migrants seem to occur in spite of their better employment related characteristics.

Table 3 also indicates there are some noteworthy differences between the IDS and HILDA sample of men in the labour force. The HILDA sample is two years older on average for AB men and one year older for migrants. Years of education have increased by half a year or more for all groups, with the largest increase occurring for the NESB migrants. In the HILDA sample migrants are increasingly concentrated in NSW and Victoria (60.8 per cent) compared to 1990 (47.7 per cent). Also the migrant sub-group in HILDA has a longer period of residence in Australia (by about four years) than in the IDS 1990 sample.[21]

[19] This is defined as (Age – years of schooling – 5).
[20] For the IDS 1990 data, the long, medium and short term migrants are defined as arrivals before 1965, between 1965 and 1985, and 1986 or later, respectively. In HILDA the corresponding time periods are before 1976 (long term), between 1976 to 1996 (medium) and after 1996 (short). The relative time periods since arrival thus correspond to five years for short term residents, twenty five to six years for medium term, and more than twenty five years for long term residents in both data sets.
[21] This difference in average period of residence is in the expected direction given there was a larger migrant inflow in the years just prior to the 1990 IDS survey than in subsequent years, leading to a proportionately larger number of recent arrivals in the 1990 reference population.

Table 3 Average Sample Characteristics by Sub-Group and Data Source: Base Model Variables (Mean Values and Proportions)

	IDS (1990)					*HILDA (2001)*				
Variables	*AB*	*Migrants*	*ALL*	*ESB*	*NESB*	*AB*	*Migrants*	*ALL*	*ESB*	*NESB*
Years of schooling	12.2	12.6	12.3	12.8	12.4	12.8	13.2	12.9	13.3	13.2
Current age	35.9	40.5	37.3	39.7	42.3	38.0	41.7	38.9	42.3	41.1
Potential labour market experience (PLFEXN)	18.8	23.3	20.0	22.0	24.6	19.9	23.2	20.8	23.9	22.5
PLFEXN in Australia (A_PLFEXN)		15.9		14.5	17.1		17.1		18.2	16.1
Years in Australia		18.5		17.9	19.6		22.8		22.9	22.8
Dummy variable proportions (%):										
Currently married	64.9	78.3	68.4	76.6	80.1	67.1	74.6	68.9	76.7	72.7
Never married	30.1	15.8	26.2	17.3	14.2	26.2	18.7	24.4	16.8	20.3
Previously married	5.1	5.9	5.4	6.1	5.7	6.7	6.7	6.7	6.4	7.0
Not reference person in family	14.1	5.7	11.8	10.1	13.2	41.6	36.6	40.4	40.1	33.5
Non-capital city location	40.5	18.7	34.6	23.5	14.0	46.9	21.5	40.6	31.2	13.0
Resides in NSW	24.0	26.2	24.2	19.5	32.8	29.0	36.0	30.2	27.2	40.0
Resides in Victoria	19.3	21.5	19.9	15.2	27.6	25.2	24.8	25.1	18.7	30.2
Resides in Queensland	21.1	13.8	19.1	18.4	9.4	21.5	15.2	19.9	21.0	10.2
Resides in South Australia	12.1	10.4	11.6	11.7	9.1	9.4	7.4	8.9	9.5	5.7
Resides in Western Australia	12.9	21.1	15.1	26.8	15.6	9.7	13.7	10.7	18.1	9.8
Resides in Tasmania	7.8	2.8	6.4	4.1	1.5	3.0	1.2	2.6	1.9	0.7
Has dependant child aged 0-4	18.2	18.5	18.3	17.5	19.4	16.8	17.8	17.1	17.4	18.2
Migrant residence periods:										
Short term resident		16.2		15.6	16.3		18.4		14.7	21.7
Medium term resident		54.1		61.2	47.5		44.5		41.8	46.8
Long term resident		29.7		23.1	36.1		36.9		43.3	31.3
Sample N	8,003	2,985	10,988	1,473	1,512	3,454	1,129	4.583	529	600

Note: AB = Australian born, ESB = English speaking background migrant, NESB = Non-English speaking background migrant.

The logit regression results for the Base model are presented in table 4. This table reports a tested down specification where, starting with the 1990 sample, some of the insignificant variables have been excluded; and the final set of parameters chosen for the 1990 model has been imposed for the 2001 HILDA model. The main substantive variables excluded are potential labour market experience.[22] In these results the dependant variable is coded one for persons who are unemployed, so a positive β coefficient indicates an increase in the PBU.

The β parameter estimates clearly show that the dummy variable for both migrant groups (MESBD and MNESBD) is significantly positive in both samples. Secondly, the coefficient on the NESB migrant dummy is substantially larger than for the ESB dummy variable. The hypothesis that these two coefficients are the same (MESBD = MNESBD) is rejected strongly in the IDS sample and weakly in the HILDA sample, as indicated by the Chi Square tests reported in table 4. These results indicate that for the same age and family characteristics and regional location, the PBU is significantly higher for migrants compared to the native born; and secondly that it is also significantly higher for the NESB group compared to the ESB group.

In table 4 the signs of all the other variables for the 1990 model are as expected. The PBU *decreases* with years of schooling, with age (but at a decreasing rate since coefficient on age squared is positive), and with the period of residence for NESB migrants. For ESB migrants, although the coefficients on the medium and long term period of residence are both negative (and also more negative for long term residence), they are not statistically significant at conventional test levels. Variables which *increase* the PBU are being unmarried or previously married, being a dependant person in the family (i.e., not the reference person), and having dependant children aged 0-4 in the family.[23] The location dummies capture the effects of local labor market conditions. The excluded regional category is Sydney or the ACT. Many of the regional dummies are insignificant, but persons living in Tasmania, Adelaide and the balance of WA had higher PBU's in 1990, irrespective of whether they were migrants or native born.

Comparing the HILDA Base model that has the identical specification and variable definitions as in the 1990 model, the main results are similar. The ESB and NESB migrant dummy coefficients are both positive, with the NESB coefficient being significantly larger. Age, years of education and marital status have similar effects, and again period of residence is significant only for NESB migrants. The results that differ are for secondary variables: not being the reference person in the household, and having dependent children aged 0-4 in the household are insignificant in the HILDA results while they were all positive (PBU increasing) in the IDS results.

[22] PLFEXN and A_PLFEXN (the potential labour market experience variables) are not included in the final specification of the Base model because they turned out to be highly correlated with age and were dropped from the regression equation.
[23] Even though this is a sample of men only the presence of very young children aged 0 to 4 affects their employment prospects in the IDS sample. Other similar dummy variables for the presence of children aged 5 to 9 or higher were insignificant.

Table 4 Base Model Logit Regression Results – IDS90 and HILDA Samples

Dependant Variable=1 for Unemployed

	IDS 1990				*HILDA 2001*			
Regressors	*β*	*s. e.*	*Wald χ2*	*Signif.*	*β*	*s. e.*	*Wald χ2*	*Signif.*
D Migrant ESB	0.545	0.234	2.3	0.020	0.730	0.422	1.7	0.084
D Migrant non-ESB	1.276	0.186	6.9	0.000	1.565	0.255	6.1	0.000
Age	-0.176	0.019	-9.1	0.000	-0.085	0.033	-2.5	0.011
Age squared	0.002	0.000	8.8	0.000	0.001	0.000	2.2	0.030
Years of education	-0.199	0.017	-11.8	0.000	-0.189	0.026	-7.4	0.000
D Never married	0.669	0.115	5.8	0.000	1.063	0.179	6.0	0.000
D Previously married	1.185	0.132	9.0	0.000	0.888	0.227	3.9	0.000
D Not reference person	0.711	0.202	3.5	0.000	-0.097	0.135	-0.7	0.475
D Balance of NSW	0.153	0.145	1.1	0.293	0.254	0.248	1.0	0.306
D Melbourne	0.055	0.121	0.5	0.652	0.153	0.220	0.7	0.485
D Balance of Victoria	0.138	0.175	0.8	0.432	0.591	0.281	2.1	0.036
D Brisbane	0.138	0.138	1.0	0.316	0.525	0.250	2.1	0.036
D Balance of Qld.	0.217	0.137	1.6	0.113	0.775	0.234	3.3	0.001
D Adelaide	0.385	0.136	2.8	0.005	0.472	0.278	1.7	0.090
D Balance of SA	0.398	0.191	2.1	0.037	0.963	0.350	2.8	0.006
D Perth	0.142	0.127	1.1	0.262	0.420	0.263	1.6	0.110
D Balance WA	0.416	0.190	2.2	0.028	0.420	0.379	1.1	0.268
D: Tasmania	0.596	0.213	2.8	0.005	1.041	0.358	2.9	0.004
D Dependant child 0-4	0.462	0.114	4.1	0.000	0.040	0.215	0.2	0.854
Period of residence *for NESB migrant*								
D medium term	-0.396	0.212	-1.9	0.062	-0.734	0.324	-2.3	0.023
D long term	-1.103	0.255	-4.3	0.000	-1.033	0.395	-2.6	0.009
Period of residence *for ESB migrant*								
D medium term	-0.163	0.258	-0.6	0.528	-0.253	0.493	-0.5	0.608
D long term	-0.363	0.328	-1.1	0.268	-0.361	0.508	-0.7	0.477
Constant	2.500	0.406	6.2	0.000	0.471	0.721	0.7	0.513
Test MESBD = MNESBD		6.3	0.011			3.1	0.079	
Test MESBD = MNESBD = 0	50.7	0.000				39.3	0.000	
log likelihood		-2973.1				-1033.2		
Test all slope coefficients = 0			628.4	0.000			243.9	0.000
Pseudo RSq. (McFadden's)				0.096				0.106
Adjusted Pseudo RSq.				0.088				0.084

Classification Table:

OBSERVED		PREDICTED			OBSERVED		PREDICTED		
		Employed	Unempl.				Employed	Unempl.	
10,005	Employed	10,009	6	99.9	4,265	Employed	4,264	1	99.9
973	Unempl.	966	7	0.6	318	Unempl.	314	4	1.3
Per cent correct prediction - overall				91.1					93.1

Note: 'D' indicates dummy variable; 'Signif.' is the significance level (p-value) of the Wald Chi Square test statistic.

A noteworthy feature of table 4 is that even though most variables are highly significant, the goodness of fit indicators are quite poor. The pseudo R^2 is around 0.1.[24] The classification table of the predicted and observed values of the dependant variable (given in the lowest panel of table 4) indicates that the Base model fails to correctly assign most of the actually unemployed. Almost all employed persons are correctly predicted by the model to be

[24] The *pseudo* R^2 in STATA logit output is equivalent to McFadden's R^2.

employed; but only about 1 per cent of the unemployed are correctly predicted to be unemployed in both the 1990 and 2001 results. The likelihood ratio test for the hypothesis that all explanatory variables, apart from the constant, are insignificant, however, is clearly rejected. Hence, although the rate of correct predictions for the actually unemployed men is very low in the Base model specification, this model is still statistically different from a naïve model that could be calibrated, with only a constant term, to predict that everyone in the sample would be employed.

Table 5 presents the estimates of the marginal effect of the regression variables on the PBU. These marginals are computed in terms of the percentage point changes in the PBU when evaluated at the mean of the data.[25] The magnitude of the marginal effects reported for the ESB and NESB migrant dummy variables reflect the increase in the PBU for the migrant who is currently married, is the reference person in the sample household, lives in Sydney or the ACT, and who has arrived in Australia in the last five years prior to the survey. [26]

Table 5 also shows an indirect decomposition of the changes in the marginal effects between 1990 and 2001, by evaluating the marginal effects based on the HILDA parameters at the mean data values of the IDS 1990 survey. These estimates of the HILDA marginal effects evaluated at Xbar(IDS), reported in column 7 of table 5, indicate that, holding the characteristics of the sample at the1990 level, the disadvantage experienced by migrants in terms of higher PBU has actually increased slightly between 1990 and 2001. (The marginal effects in column 7 are higher than those in column 1 for both migrant dummy variables). However, the standard errors on these estimates of marginal effects are large enough to reject the hypothesis that the increased disadvantage of migrants in 2001 is statistically significant.[27] The main inference is rather that over time the pattern of higher PBU for migrants remains more or less constant, and that at each given point in time, there is a statistically significant difference in the PBU for ESB and NESB migrants.

[25] Table 5 presents the marginal effects evaluated at the mean of the data which lead to the predicted probability of unemployment at the mean that are indicated in the last row of table 5. The marginal effect of specific variables is then expressed as the percentage point changes from this level of the predicted PBU at the mean of the data. For dummy variables the marginal effect represents the change in the PBU for persons with and without that characteristic, holding all other variables fixed at the sample mean level.

[26] These other characteristics of the migrant, to whom the marginal effect of the ESB and NESB dummy variables in table 5 applies, are derived from the excluded categories on all the other dummy variables included in the regression results of table 4.

[27] An alternative way to test whether there is a significantly higher level of employment disadvantage for migrants in 2001 was carried out by estimating the Base model specification jointly for the combined IDS 1990 and HILDA samples, with a 2001 time period dummy interacted with the migrant status variables. This 2001 period interaction variable was insignificant for both ESB and NESB migrants, and a joint test for no time period difference in the two migrant status variables was not rejected (Chi Sq.(2) statistic = 0.42 with significance level 0.81).

Table 5 Base Model Logit Marginal Effects (at Mean of Data, in Percentage Points)

Dependant Variable=1 for Unemployed

	IDS 1990				*HILDA 2001*		
	1	*2*	*3*	*4*	*5*	*6*	*7*
Regressors	*Marginal Effects at Xbar(IDS) (δ)* 100*	*s. e.*	*Signif.*	*Marginal Effects at Xbar(Hilda) (δ)* 100*	*s. e.*	*Signif.*	*Marginal Effects at Xbar(IDS) (δ)* 100*
Migrant ESB	4.11	2.08	0.048	4.53	3.32	0.172	5.61
Migrant non-ESB	12.21	2.48	0.000	12.96	3.23	0.000	15.75
Age	-1.11	0.12	0.000	-0.40	0.16	0.011	-0.51
Age squared	0.01	0.00	0.000	0.00	0.00	0.030	0.01
Years of education	-1.26	0.10	0.000	-0.90	0.12	0.000	-1.14
Never married	4.90	0.96	0.000	6.66	1.40	0.000	8.20
Previously married	11.89	1.87	0.000	6.06	2.08	0.003	7.63
Not reference person	6.09	2.25	0.007	-0.46	0.63	0.471	-0.56
Balance of NSW	1.02	1.03	0.319	1.32	1.41	0.347	1.68
Melbourne	0.35	0.80	0.657	0.77	1.15	0.504	0.97
Balance of Victoria	0.92	1.23	0.455	3.56	2.09	0.088	4.50
Brisbane	0.92	0.96	0.339	3.05	1.74	0.080	3.83
Balance of Qld.	1.48	1.01	0.141	4.92	1.90	0.009	6.18
Adelaide	2.80	1.12	0.013	2.72	1.91	0.154	3.39
Balance of SA	2.97	1.65	0.072	6.99	3.58	0.051	8.65
Perth	0.94	0.88	0.285	2.36	1.72	0.169	2.93
Balance WA	3.12	1.66	0.060	2.40	2.56	0.348	3.01
Tasmania	4.83	2.15	0.025	7.83	3.90	0.044	9.40
Has dependant child age 0-4	3.33	0.92	0.000	0.19	1.05	0.856	5.35
Period of residence dummies *for NESB migrant*							
Medium term	-2.17	1.00	0.030	-2.66	0.88	0.002	-3.40
Long term	-4.66	0.68	0.000	-3.31	0.82	0.000	-4.25
Period of residence dummies *for ESB migrant*							
Medium term	-0.97	1.45	0.503	-1.09	1.91	0.569	-1.40
Long term	-1.99	1.54	0.196	-1.49	1.81	0.409	-1.89
Combined effect of a marginal change in age	-0.61			-0.24			-0.31
Predicted probability level at mean of data (%)	6.79			5.03			6.45

Note: The marginal effects for dummy variable categories are derived as the absolute change in the probability of being unemployed computed with the dummy variable set to 1 and 0, respectively.
Xbar(IDS) and Xbar(HILDA) denote mean of the sample data for regressors in the IDS 1990 and HILDA samples.

A clearer picture of the marginal effects emerges when the change in PBU is evaluated not at the sample mean of the data but with respect to a specific type of person. These results are given in table 6, where the reference person chosen is someone who has the HILDA sample average values on the continuous variables in the model but has all the dummy variable categories turned off. Table 6 then shows the predicted PBU for such a person as he changes from the excluded category to the indicated category for each of the dummy variables turned on one at a time. For instance, the first row in

the top panel of table 6, using the 1990 IDS parameter estimates, indicates the predicted PBU is 3.1 per cent for the Australian born reference person. If this reference person is now converted to an ESB migrant who entered Australia after 1985, his predicted PBU increases to 5.2 per cent. Similarly, for a NESB migrant with these same reference characteristics, the predicted PBU increases to 10.3 per cent - which is more than three times higher than the predicted PBU for the AB reference person. Consistent with the time pattern of marginal effects noted in table 5, the gap in the predicted PBU's in table 6 between a native born and the two types of migrants stays more or less the same in the estimates in the lower panel of table 6, which are based on the 2001 HILDA sample parameter estimates.

Table 6 Base Model Predicted Probability of Being Unemployed for Various Categorical Groups (in Percentage)

Sample Reference Person: 39 years old; 13 years of schooling; currently married; lives in Sydney or the ACT.

Using IDS90 Parameter Estimates			
Predicted Probability of Unemployment for Reference Person by Country of Birth	*AB* 3.1	*ESB* 5.2	*NESB* 10.3
Then change other characteristics			
Being never married	5.9	9.7	18.3
Being previously married	9.5	15.3	27.3
Lives in Balance of NSW	3.6	6.0	11.8
Lives in Melbourne	3.3	5.5	10.8
Lives Balance of Victoria	3.5	6.0	11.6
Lives in Brisbane	3.5	6.0	11.6
Lives in Balance of Qld.	3.8	6.4	12.5
Lives in Adelaide	4.5	7.5	14.4
Lives in Balance of SA	4.6	7.6	14.6
Lives in Perth	3.6	6.0	11.7
Lives in Balance of WA	4.6	7.7	14.8
Lives in Tasmania	5.5	9.1	17.2
*For migrants** :			
Medium term resident		4.5	7.2
Long term resident		3.7	3.7
Using HILDA 2001 Parameter Estimates			
Predicted Probability of Unemployment for Reference person by Country of Birth	2.2	4.5	9.8
Then change other characteristics			
Being never married	6.2	12.0	23.9
Being previously married	5.2	10.3	20.9
Lives in Balance of NSW	2.8	5.7	12.3
Lives in Melbourne	2.6	5.2	11.2
Lives Balance of Victoria	3.9	7.8	16.4
Lives in Brisbane	3.7	7.4	15.5
Lives in Balance of Qld.	4.7	9.3	19.1
Lives in Adelaide	3.5	7.0	14.8
Lives in Balance of SA	5.6	11.0	22.2
Lives in Perth	3.3	6.7	14.2
Lives in Balance of WA	3.3	6.7	14.2
Lives in Tasmania	6.0	11.8	23.5
*For migrants** :			
Medium term resident		3.5	5.0
Long term resident		3.2	3.7

* Note reference category for migrants is someone who arrived in the past five years.

Table 6 also shows there are other significant effects on the predicted PBU due to changes in other characteristics. There is a large difference in the predicted PBU on the basis of marital status - between currently married and never or previously married men. Divorced and/or never married NESB migrants appear to be particularly disadvantaged since they record the highest levels of predicted PBU in both samples. One other clear finding is the manner in which the predicted PBU for NESB migrants decline substantially with a longer period of residence. Looking at the IDS 1990 results, the predicted PBU of 10.3 per cent for a short term NESB migrant falls to 7.2 per cent over the medium term and to 3.7 per cent over the long term. Similar declines are recorded with the 2001 HILDA model parameter estimates. Nevertheless it is noteworthy that the predicted PBU for long term NESB migrants are still higher than for the AB reference person in both time periods.[28]

4. Extended Model: Specification and Results

This section presents an Extended model specification for the risk of unemployment which can be estimated from the additional detailed information available in wave 1 of HILDA. The extensive range and level of information available in HILDA for the responding individual is quite unique in an Australian survey. The wave 1 questionnaire modules for HILDA are a particularly suitable data set for analyzing labour market outcomes because it collected specific information on life cycle events of the individual's labour market exposure, work history, on the timing and minute details of educational qualifications and also on some background characteristics on parents and their labour market status while the respondent individual was growing up.[29] This type of detailed information is not available in the Australian census and other data bases which have formed the basis for past studies on the relative risk unemployment of migrants and native born persons in Australia. The HILDA wave 1 data thus offers an unique opportunity not only to test more general model specifications but also to verify how robust are the parameter estimates and the underlying marginal effects usually estimated from a restricted set of regressors, such as those used in the Base model of section 3. These additional features of the HILDA data compensate sufficiently for the relatively smaller sample size available for migrants in HILDA compared to the census one per cent sample.

The additional information available in HILDA, both on general personal characteristics and specific employment related aspects, is vast. As a first cut of the extra information available, this Section focuses on incorporating the extra variables in HILDA along these few specific dimensions of individual and parental characteristics of individuals:

[28] A similar pattern is also observed for ESB migrants by period of residence in table 6. But the predicted PBU for ESM migrants by period of residence are based on β parameters in table 4 which are not significantly different from zero; hence they should be treated with caution. See, Westin (1974) for a discussion of the treatment of standard errors for predictions from binary choice models.

[29] The uniqueness about parental characteristics in HILDA is that some data about parents is available for the time when the respondent was growing up. Contemporous data on parents and children still living at home are found in the census and other surveys as well; but this is not usually sufficient to correctly identify inter-generational dependence in a causal sense since parents and children can share contemporous unobserved heterogeneity. See, Gottschalk (1996).

For migrants:
- detailed data on country of origin,
- exact year of arrival in Australia,
- whether schooling and qualifications was received was in Australia, (for migrants from non-ESB countries only):
- whether at a personal level English was their first language,

For all respondents:
- additional details on the level and type of schooling (public/private),
- additional details on qualification type and training certificates,
- information about parental occupation and their labour market history,
- greater detail on own and parental marital history,
- details of respondent's life cycle and recent labour market history,
- details on respondent's long term health conditions.

The selection of these additional variables has been motivated by selective previous results on migrant unemployment as well as by wider themes on the general determinants of individual unemployment. A limited number of Australian studies have shown significant country of birth effects, particularly for NESB groups such as Vietnamese and Lebanese migrants (see, review in Wooden, 1994, p. 232-33). The additional general variables on parental unemployment and characteristics specified above take up the theme of inter-generational transmission of labour market disadvantage and welfare dependency, which, though studied in a limited way in the Australian context, has an extensive international literature. The role of family dissolution and other childhood events on life cycle employment prospects have also been highlighted. Although this paper does not look at the issue of unemployment duration, details of past labour market history are expected to account for some of the unobserved individual heterogeneity and can be usefully integrated into a model of current employment. Finally, the effect of poor health on employment status is also increasingly well established.[30]

A more complete list of additional variables that could serve as important correlates of unemployment at the individual level could easily be drawn up from the extensive data just in wave 1 of HILDA. But the main interest here is not to present as comprehensive a model as possible to estimate the PBU of migrant men relative to the native born, but rather to test how robust the conventionally specified Base model of section 3 is to alternative combinations of extra regressors on which data are usually not available.

Finally, it should be noted that the HILDA survey is still missing data on some important variables that other studies have shown to be relevant for determining the employment prospects of migrants. Since HILDA is not a migrant-specific survey it does not provide any details about the actual selection process and visa categories under which migrants entered Australia, nor any further details on the functional English language proficiency of NESB migrants who do not have English as their first language. These are shown to be important correlates of migrant unemployment status in studies using the LSIA sample (i.e. Cobb-Clark, 2000).

[30] Stewart (2001) is a recent examination of the effects of health status on unemployment. Also see, Gottschalk (1992) for a general discussion of inter-generational transmission of welfare dependency and unemployment in the USA.

Details of these additional variables available from HILDA that were proposed for inclusion in the Extended model specification are given in table 7, where their sub-group averages are also reported. Migrants' country of birth categories have been grouped into seven sources: UK, New Zealand and Other ESB; and for the NESB grouping, Vietnam, China, South Asia and Other NESB, based on the sample sizes for individual countries of birth observed in the HILDA sample. Further educational details are available for type of school attended and different kinds of qualifications and training. Around 38 per cent of migrants report having Australian post-school qualifications (compared to 68 per cent for the native born sample).

Table 7 Extended HILDA Model Data Summary (Mean Values and Dummy Variable Proportions as Percentage)

Variables	*AB*	*Migrants*	*ALL*	*ESB*	*NESB*
Migrant characteristics:					
Country of birth_UK		27.4	6.8	58.6	
Country of birth_NZ		13.0	3.2	27.8	
Country of birth_otherES		6.4	1.6	13.6	
ESB short term resident		6.8	1.7	14.6	
ESB medium term resident		19.6	4.8	41.8	
ESB long term resident		20.3	5.0	43.3	
NESB with English as first language		8.1	2.0		15.3
Country of birth_Vietnam		2.2	0.5		4.2
Country of birth_China		3.9	1.0		7.3
Country of birth_S. Asia		6.3	1.5		11.8
Country of birth_otherNES		40.7	10.0		76.7
NESB short term resident		11.5	2.8		21.7
NESB medium term resident		24.9	6.1		46.8
NESB long term resident		16.7	4.1		31.3
Age	38.0	41.7	38.9	42.3	41.1
Attended independent school	9.3	11.0	9.7	10.0	11.8
Has Australian post-school qualification	65.5	37.8	58.7	36.8	38.7
Post graduate qualification	8.3	16.7	10.4	17.4	16.2
Teaching or nursing qualification	2.9	2.7	2.9	4.0	1.7
Number of training courses*	1.3	1.1	1.3	0.8	1.3
Regional location:					
Sydney	13.8	30.0	17.3	20.6	34.5
Balance of NSW	15.2	6.0	12.9	6.6	5.5
Melbourne	16.4	22.3	17.8	15.3	28.5
Balance of Victoria	8.9	2.5	7.3	3.4	1.7
Brisbane	9.1	9.7	9.3	14.0	5.8
Balance of Queensland	12.3	5.6	10.7	7.0	4.3
Adelaide	6.1	6.4	6.1	7.6	5.3
Balance of SA	3.4	1.1	2.8	1.9	0.3
Perth	6.5	10.8	7.5	13.6	8.3
Balance WA	3.2	2.9	3.2	4.5	1.5
Tasmania	3.0	1.2	2.6	1.9	0.7
Northern Territory	0.6	0.9	0.6	0.9	0.8
ACT	1.6	2.7	1.9	2.6	2.8
Indigenous person	1.8		1.4		
Parents employed when aged 14	94.2	93.1	93.9	95.8	90.7
Father's Occupation: Manager/Professional	28.8	31.1	29.4	28.0	33.8
Parents divorced:	19.8	15.8	18.8	20.8	11.3
when aged 0-10	9.4	7.4	8.9	9.8	5.3
when aged 11-15	5.0	2.8	4.4	4.2	1.7
when aged 16+	5.5	5.5	5.5	6.8	4.3
Percentage time not in labour force:					
last year	1.8	2.4	1.9	2.8	2.0
in work history	4.5	8.3	5.5	5.3	11.0
Has long term health condition	14.2	12.7	13.8	15.7	10.0
Sample N	3,454	1,129	4,583	529	600

* See footnote 35 in the text for description of the variable 'Number of training courses'.

The sub-set of parental characteristics chosen has three dimensions - whether any parent was employed while the child was growing up at around age 14; whether the parents ever divorced, and at what age of the child; and whether the father's occupation was as a manager or professional. There are some slight differences among the three sub-groups in these characteristics. Parental divorce is lower among NESB migrants (11 per cent compared to almost 20 per cent for the native born). There is also a higher incidence of the father being a manager or professional among NESB migrants (reflecting perhaps the higher degree of self selection of NESB migrants, which is consistent with their higher levels of education compared to both ESB migrants and the native born).

The labour market history of the respondent is captured by looking at the proportion of time not in the labour force. This is derived for two time periods – in the last year, and over the entire work history period (the time since leaving full time education for the first time). The mean values indicate that on average respondents spent about 2 per cent of the last year not in the labour force, and this does not vary much across country of birth groups. Over the entire working history, NESB migrants report substantially larger proportion of time not in the labour force (11 per cent compared to 4 or 5 per cent for AB and ESB migrants).

This paper does not explore alternative ways to utilize the work history data available in HILDA wave 1 to further refine the Extended model specification. While this can be usefully targeted for future research, it is worth noting that these work history variables must be carefully constructed to avoid having a model specification in which current unemployment may be 'explained' merely by past unemployment.

The health effect considered in the Extended model is limited to a single indicator of whether the respondent has a long term health condition. While HILDA has more extensive health information, including a self-assessment on the standard SF-36 Health Survey, there is likely to be a two-way causal mechanism between unemployment status and contemporous health status (Stewart, 2001). Hence, the SF-36 form responses are not utilized in this paper to explain current unemployment. The existence of a long term health condition, however, should be unrelated to the current spell of unemployment (provided the latter is also not of a very long term duration).

Logit regression results for the parameter estimates of the Extended model are presented in tables 8 and 9. Table 8 contains the results for selected parameter estimates of interest for alternative ways of representing various country of birth dummies in the Extended model, with and without the dummy variable indicator of English as a first language for NESB migrants.[31] In model version 1 of table 8, which has only the standard migrant classifications as ESB and NESB, together with a dummy variable to indicate whether a NESB migrant reports English as his first language, the ESB and NESB coefficients continue to be highly significant and positive. The English language dummy for NESB migrants is negative, as expected,

[31] The full regression results for the logit parameters of version 2 of the Extended model in table 8 are presented in table 9. All versions of the models reported in table 8 have the same set of other additional variables that are listed in the complete results of version 2 in table 9.

but surprisingly this coefficient is not significant at conventional levels. This result contrasts with previous census based studies that have consistently found proficiency in English to be an important variable affecting employment prospects of NESB migrants (Miller and Neo, 1997).

Version 2 of the Extended model uses more dis-aggregated categories for country of birth for both groups of migrants. All of the individual country of birth coefficients have a positive sign, indicating a higher PBU for that group when compared to the native born. The lowest valued β coefficient is for the country of birth China dummy variable, but this coefficient is not significantly different from zero in any of the versions presented in table 8. What is surprising is the negative effect of having English as a first language is not significant in version 2 of the Extended model as well. This result is partly due to the low PBU for Chinese migrants none of who, as expected, report English as a first language.[32]

Version 3 of the Extended model drops the insignificant English as a first language dummy for NESB migrants from version 2. Compared to version 2, this has no effect either on the magnitudes of the estimated β coefficients for country of birth categories, nor on the significance levels of these estimates. The inference from both version 2 and 3 is that the joint test that all three ESB coefficients are zero cannot be rejected at conventional significance levels. A similar joint test that all four NESB country of birth coefficients are zero is strongly rejected. Version 4 of the model presented in table 8 removes the individual ESB country of birth variables and substitutes a common ESB dummy (M_ESB), which is significantly different from zero at the 10 per cent significance level.

In a statistical sense, version 2 of the Extended model can be tested down eventually to version1 with only generic ESB and NESB dummies, which are both significantly different from zero. But in spite of the small sample sizes the individual country of birth parameters in Version 2 do convey some extra information since specific subsets of the individual NESB country of birth dummies are always significantly different from zero.

The complete regression results for version 2 of the Extended model (with the seven country of birth dummies) together with the computed marginal effects at the mean of the data are presented in table 9. At the mean of the data, the logit estimates of the marginal effects for the country of birth dummies are as follows (in percentage points): 5.1 for UK migrants, 3.5 for New Zealand, 9.1 for other ESB migrants, 19.2 for Vietnamese migrants, 5.2 for Chinese, 16.1 for South Asian and 14.1 for other NESB migrants who do not report English as a first language. The standard errors for these point estimates of the NESB marginal effects at the mean show that all individual

[32] The estimates of individual country of birth coefficients in tables 8 to 10 should be treated with caution because of the small sample sizes in specific categories. Nonetheless, they pick up some important differences. In the HILDA sample used, out of the 25 people reporting China as their country of birth, only one is reported as unemployed. This country specific effect for China (leading to a small predicted PBU for Chinese migrants) seems large enough to override the positive effect of English as a first language that is observed among other NESB migrants. For migrants in the Other_NESB country categories, only five out of 92 (5.4 per cent) are unemployed among those who report English as a first language, while this proportion is substantially higher, 59 out of 508 (11.6 per cent) for Other NESB migrants who do not report English as a first language.

Table 8 Selected Parameter Estimates of Logit Regressions for the Extended Model with HILDA Data

	Version 1			*Version 2*			*Version 3*			*Version 4*		
	β	*s. e.*	*Signif.*	*β*	*s. e.*	*Signif.*	*β*	*s. e.*	*Signif.*	*β*	*s. e.*	*Signif.*
Migrant- ESB	0.820	0.441	0.063							0.820	0.441	0.063
Country of birth_UK				0.865	0.531	0.103	0.866	0.531	0.103			
Country of birth_NZ				0.639	0.486	0.189	0.642	0.486	0.186			
Country of birth_otherES				1.203	1.240	0.039	1.241	0.603	0.040			
Migrant-NESB	1.712	0.277	0.000									
Country of birth_Vietnam				1.752	1.927	0.001	1.930	0.581	0.001	1.917	0.581	0.001
Country of birth_China				0.839	0.447	0.480	0.835	1.103	0.449	0.823	1.103	0.455
Country of birth_S. Asia				1.515	1.750	0.001	1.593	0.512	0.002	1.733	0.524	0.001
Country of birth_other NES				1.643	1.732	0.000	1.679	0.284	0.000	1.723	0.288	0.000
English as first language	-0.628	0.514	0.222	-0.637	0.522	0.223				-0.635	0.522	0.224

country of birth effects are significantly different from zero at the 10 per cent test level, except for China.

The other notable PBU increasing large marginal effects in table 9 are for Australian native born indigenous men (9.9 percentage points); specific regional locations, i.e., Tasmania (6.3 points) and the Northern Territory (7.3 points); and never married status (5.4 points).

The results for the period of residence are consistent with the Base model and earlier studies which show significant falls in the PBU with an increasing period of residence only for NESB migrants. The marginal effects however are quite muted. The excluded category is short term residents. A long term resident of over 25 years has only a 2.7 percentage point difference in the PBU compared to a short term NESB migrant arrived in the last five years. A more detailed specification of the period residence using actual years in Australia as a continuous variable did not improve the Extended model specification compared to the broad periods of residence dummies as specified in the Base model.[33]

All other variables in version 2 of the Extended model (in table 9) have expected signs (or are insignificant if not of the expected sign). Age has a significant quadratic effect and years of schooling has a substantial impact in reducing the PBU. Regarding parental characteristics, having at least one parent employed when the respondent was aged 14 has a significant negative effect on reducing the PBU, with a marginal effect of – 2.4 percentage points. Parental divorce has an opposite effect in increasing the PBU, but the critical effect seems to occur only when the divorce occurred when the respondent was between 11 and 15 years old. The estimated β parameter for divorce occurring at that time is significant at the 10 per cent level, while parental divorce occurring at younger and older age groups don't have significant coefficients.

Additional significant effects for an increasing PBU are observed for respondents with a long term health condition, and also if the individual has not been regularly participating in the labour force in the recent past. Greater absence from the labour force over the longer time of the entire working age horizon also has a positive coefficient for increasing the PBU, but the effect is not significant. The significance of longer absence from the labour force in the past year increasing the current PBU is consistent with a view that recent job search intensity (which places unemployed people in the labour force) is associated with reducing the PBU in the subsequent time periods. [34]

[33] A continuous years in Australia variable becomes insignificant, as do even more categorical periods of residence variables for more categories than the 'long' 'medium' and 'short' specified as in the Base model.

[34] The variable 'proportion of time absent from the labour force in the past 12 months' could also capture the expected correlation between current employment and the continuing employed status of those who were employed for the full duration of the last 12 months, which automatically places them in the labour force for the full duration. Thus no (or low levels of) absence from the labour force in the past 12 months is positively associated with being currently employed. There however is no reason why there should not be a similar association for currently unemployed people as well. Someone currently unemployed could also have no absence from the labour force in the past 12 months (by either being employed or actively looking for work regularly). Hence a low value of the absence from the labour force need not automatically correlate with being employed continuously in the past 12 months.

Table 9 Extended HILDA Model Full Logit Regression Results - Version 2 (with Main Country/Region of Birth Dummies)

Dependant Variable=1 for Unemployed

	Parameters			*Marginal Effects*		
Regressors	β	*s. e.*	*Signif.*	δ*100	*s. e.*	*Signif.*
ESB migrants:						
Country of birth_UK	0.865	0.531	0.103	5.14	4.29	0.231
Country of birth_NZ	0.639	0.486	0.189	3.52	3.44	0.306
Country of birth_otherES	1.240	0.602	0.039	9.10	6.87	0.186
ESB medium term resident	-0.242	0.515	0.638	-0.91	1.76	0.603
ESB long term resident	-0.613	0.566	0.278	-2.01	1.42	0.158
NESB migrants:						
Has English as first language	-0.637	0.522	0.223	-2.03	1.24	0.101
Country of birth_Vietnam	1.927	0.581	0.001	19.22	10.31	0.062
Country of birth_China	1.750	0.525	0.001	5.16	9.45	0.585
Country of birth_S. Asia	1.732	0.289	0.000	16.09	8.35	0.054
Country of birth_otherNES	-1.250	0.659	0.058	14.10	3.83	0.000
NESB medium term resident	-0.763	0.352	0.030	-2.38	0.81	0.003
NESB long term resident	-0.956	0.414	0.021	-2.74	0.79	0.001
Common Parameters:						
Age	-0.065	0.033	0.048	-0.27	0.14	0.049
Age squared	0.001	0.000	0.081	0.00	0.00	0.082
Education:				0.00	0.00	
Years of education	-0.144	0.029	0.000	-0.60	0.12	0.000
Attended independent school	-0.277	0.247	0.261	-1.05	0.84	0.212
Post graduate	-0.504	0.375	0.179	-1.76	1.08	0.101
Teaching or nursing qualifications	-1.074	0.769	0.-2.91	1.24	0.019	
Number of training courses*	-0.845	0.803	0.293	-3.52	3.34	0.291
Never married	1.004	0.168	0.000	5.42	1.14	0.000
Previously married	0.811	0.224	0.000	4.71	1.72	0.006
Regional Location:						
Balance of NSW	0.245	0.255	0.337	1.11	1.26	0.376
Melbourne	0.167	0.226	0.458	0.73	1.04	0.480
Balance of Victoria	0.675	0.288	0.019	3.69	2.01	0.066
Brisbane	0.452	0.260	0.082	2.24	1.51	0.138
Balance of Qld.	0.763	0.241	0.002	4.23	1.72	0.014
Adelaide	0.507	0.285	0.076	2.60	1.77	0.142
Balance of SA	0.995	0.365	0.006	6.46	3.41	0.058
Perth	0.382	0.274	0.163	1.85	1.53	0.225
Balance WA	0.641	0.414	0.121	3.54	2.94	0.228
Tasmania	0.976	0.368	0.008	6.29	3.40	0.064
Northern Territory	1.065	0.665	0.109	7.27	6.78	0.283
Indigenous person	1.306	0.331	0.000	9.90	3.99	0.013
Parents employed when aged 14	-0.480	0.196	0.015	-2.44	1.21	0.043
Father's Occupation: Manager/Prof.	-0.251	0.158	0.113	-1.00	0.60	0.096
Parents ever divorced:						
when aged 0-10	0.292	0.191	0.126	1.36	0.99	0.170
when aged 11-15	0.452	0.258	0.080	2.28	1.56	0.142
when aged 16+	0.187	0.257	0.467	0.84	1.25	0.499
Time not in labour force (%):						
during last year	0.020	0.005	0.001	0.08	0.02	0.000
during entire work history	0.004	0.004	0.269	0.02	0.02	0.269
Has long term health condition	0.726	0.154	0.000	3.89	1.03	0.000
Constant	-0.319	0.716	0.66			
log likelihood	-980.9					
Joint tests of significance:						
all ESB country dummies = 0	*4.73*	*chi2(3)*	*0.19*			
all NESB country dummies = 0	*39.8*	*chi2(4)*	*0.00*			
all country dummies = 0	*42.6*	*chi2(7)*	*0.00*			
all slope parameters insignificant	*348.5*	*chi2(41)*	*0.00*			
Pseudo RSq. (McFadden's)			*0.151*			
Adjusted Pseudo RSq.			0.114			

Classification Table:

OBSERVED		PREDICTED		
		Employed	Unemploy.	% Correct Prediction
4,265	Employed	4,250	15	99.6
318	Unemploy.	301	17	5.3
4,583	Total	4,351	32	93.1

Note: Marginal effects at mean of data, in percentage points.

The extra detail available in HILDA on education and qualifications also lead to reasonable results in the signs of these additional variables even though they may not all be significantly different from zero. In addition to the effects of years of education, the PBU is reduced by having attended an independent private school, by having post graduate qualifications, by being qualified as a teacher or nurse, and by having obtained a higher number of training qualifications, such as in computers or business courses.[35] Years of education when interacted with the two migrant status dummy variables was not significant; nor was having acquired post-secondary qualifications in Australia a significant effect on reducing the PBU for migrants. In previous studies there is mixed evidence on what first appears to be a reasonable hypothesis that overseas qualifications of migrants is valued less than Australian qualifications. Several other studies have also reported that for migrants with some post-secondary qualifications, the additional advantage on employment prospects of having received that qualification in Australia is negligible (Chiswick and Miller, 1992, p. 41; also Inglis and Stromback, 1986, p. 314).

Comparing the logit estimates of the marginal effects from the Base model (column 4 of table 5) and the estimates for the Extended model in table 9, the results for the common variables are broadly similar. The addition of the extra variables in the Extended model, while being significant regressors, does not substantially alter the marginal impact attributed to the variables already included in the Base model, such as education, age and period of residence for migrants. Hence, these marginal effects appear quite stable.

Comparing the classification table between observed and predicted outcomes for the Base and Extended models (in tables 4 and 9), the extra HILDA variables lead to improved predictions for the unemployed. In the Base case only 1.3 per cent of the actually unemployed were correctly predicted (i.e. with estimated PBU > 0.5), but this has increased to 5.3 per cent in the Extended model. The Adjusted Pseudo RSq. has also increased from 0.08 to 0.11. These improved fit and prediction measures for the Extended model are still low; but such an outcome is expected for binary dependent variable models where the two states modeled are unevenly distributed (Greene, 1993, p. 652), as is always the case in a sample of unemployed and employed individuals.

Tables 10 and 11 give values of the actual predicted PBU levels for persons with different characteristics. Firstly, table 10 shows how the predicted PBU's change from a reference Australian born person if the individual is assigned different short term migrant status. The predicted PBU for the AB reference person of table 10 is a very low 1.9 per cent. This probability increases to 3.6 per cent for the New Zealand born ESB migrant, 4.5 per cent for the UK born, and 6.4 per cent for Other ESB migrants with the same characteristics as the AB reference person. Among NESB country categories, the PBU is lowest for migrants from China (4.4 per cent) and highest for migrants from Vietnam (11.9 per cent). The higher PBU for Vietnamese migrants is consistent with earlier findings (Stromback, *et al*., 1992).

[35] The variable 'number of training courses' is created as the sum of the number of qualifications in the HILDA codebook qualification categories of AEDQn19 to AEDQn23, which refer to business, secretarial and computer courses.

Table 10 Extended HILDA Model Predicted Probability of Being Unemployed for Various Migrant Categories (in Percentage)

Sample Reference Person: Australian born 39 years old; 13 years of schooling; currently married; lives in Sydney / ACT; at least one parent working when reference person aged 14; parents never divorced.*

Predicted Probability of Unemployment for Reference Person	1.93
Then change country of birth:	
Country of birth_UK	4.5
Country of birth_NZ	3.6
Country of birth_otherES	6.4
Country of birth_Vietnam	11.9
Country of birth_China	4.4
Country of birth_S. Asia	10.2
Country of birth_otherNES	10.0
Country of birth_otherNES + English first language	9.1

* Note: Other dummy variable categories that are turned off to create the reference person's characteristic are: did not attend independent school; has no postgraduate, teaching, or nursing qualifications; father was not a manager or professional, and does not have a long term health condition.

Table 11 Extended HILDA Model Predicted Probability of Being Unemployed for Various Categorical Groups (in Percentage)

Sample reference person: 39 years old; 13 years of schooling; is currently married; lives in Sydney / ACT; at least one parent working when reference person aged 14; parents never divorced.

Predicted Probability of Unemployment for Reference Person	*AB*	*Other ESB**	*Other NESB**
By Country of Birth	1.9	6.4	10.0
Then change other characteristics:			
Has Post graduate qualifications	1.2	4.0	6.3
Teaching or nursing qualification	0.7	2.3	3.7
Never married	5.1	15.7	23.3
Previously married	4.2	13.3	20.1
Lives in:			
Balance of NSW	2.5	8.0	12.5
Melbourne	2.3	7.5	11.7
Balance of Victoria	3.7	11.8	18.0
Brisbane	3.0	9.7	14.9
Balance of Qld.	4.1	12.8	19.3
Adelaide	3.2	10.2	15.6
Balance of SA	5.1	15.6	23.2
Perth	2.8	9.1	14.0
Balance WA	3.6	11.5	17.5
Tasmania	5.0	15.3	22.8
Northern Territory	5.4	16.5	24.4
Is Indigenous person	6.8		
Both parents unemployed when aged 14	3.1	9.9	15.3
Parents divorced:			
When aged 0-10	2.6	8.4	13.0
When aged 11-15	3.0	9.7	14.9
When aged 16+	2.3	7.6	11.9
Has long term health condition	3.9	12.4	18.7
Migrant's period of residence:			
Medium term		5.1	5.0
Long term		3.6	4.1

* Reference category for both Other ESB and Other NESB migrant is a short term resident who arrived in Australia after 1996. Other NESB reference person also does not have English as a first language.

Table 11 then shows how a change in other characteristics affects the PBU for the three illustrative reference persons constructed from the country of birth effects of table 10. (The three chosen for illustration are - AB, Other ESB, and Other NESB). Table 11 again shows higher PBU's for a combination of NESB origin and employment disadvantaged regional location. For instance, the predicted PBU for a short term Other NESB migrant living in the Northern Territory is 24.4 per cent (which is the highest value recorded in table 11). For all three reference persons there are large decreases in the PBU from having post graduate, or teaching or nursing qualifications. An Other NESB migrant with a teaching or nursing degree has a predicted PBU of 3.7 per cent only, compared to the reference person without such qualifications who has a predicted PBU of 10 per cent. The predicted PBU for the reference NESB migrant category is also substantially reduced by a longer period of residence. A long term Other NESB migrant has a predicted PBU of only 4.1 per cent.

Finally, one should note that the predicted PBU's derived in table 10 and 11 (also table 6 for the Base model) are a just a tool for illustrating the effects on the risk of unemployment of the estimated logit regression β parameters which themselves do not have much intuitive meaning. However, deriving the predicted PBU's by turning on one or several dummy regression variables can lead to hypothetical characterizations of individuals that may involve out of sample predictions - i.e. there need not be many real people in some of these hypothetical classifications. Therefore the categories for comparison must be constructed carefully and the predicted PBU values treated with caution. Nevertheless, the illustrative use of the predicted PBU's helps to identify the relative weightage of different variables in explaining unemployment probabilities that are not evident from the regression coefficients or marginal effects. For instance, table 11 shows that a long term Other NESB migrant living in Sydney / ACT faces the same predicted employment disadvantage as a native born person of the same characteristics who lives in the Balance of Queensland region.

5. Summary and Further Discussion

This paper has shown that the probability of unemployment for male migrants remains consistently higher than for an average native born Australian. Using a new dataset – wave 1 of HILDA which refers mainly to the latter half of 2001, and which has substantially more detailed information on individual and parental characteristics that permits a more refined comparison of like with like for different country of birth categories – the predicted probability of unemployment for both ESB and NESB migrants are persistently higher than for the native born. These results are broadly consistent with earlier studies on this theme that have mainly used Australian census data with a more limited set of variables.

The results here confirm that English language ability, proxied at a first level by a distinction between countries of birth which are mainly English speaking (ESB) and non-English speaking (NESB), lead to a dramatic difference in the employment prospects of migrants. The higher relative disadvantage of NESB migrants is, however, moderated quite strongly over a longer period of residence. The period of residence effects are not statistically significant for ESB migrants who have a lower relative

employment disadvantage initially than NESB migrants. But even over a 25 year period of residence the relative risk of unemployment of NESB migrants does not approach that of native born Australians. This puts a different perspective on the labour market assimilation of NESB migrants than is obtained from studies based on longitudinal migrants-only data which show a dramatic decline in the risk of unemployment of migrants in the first one or two years (i.e. VandenHeuevel and Wooden, 2000). It appears these initial improvements are not persistently maintained to achieve eventual equality with the native born.

An important qualification to the broad distinction between ESB and NESB migrants is that for the limited number of NESB migrants who still claim English as their first language, there was no significant effect of their language ability in reducing their risk of unemployment compared to other NESB migrants. This result also contrasts with earlier findings of the significant role of English language proficiency. Our results suggest the possibility that in the Australian labour market the ESB and NESB source distinction may reflect more than just an individual's English language ability. There could either be some type of ethnic or regional profiling where average characteristics of sub-groups are given prominence, or even more overt forms of discrimination may occur between an ESB and NESB migrant with equivalent English language ability.

This paper has also compared the relative disadvantage of migrants over two time periods – 1990 and 2001, using the ABS Income Distribution Survey data for the 1990 period. The IDS 1990 survey has a more limited set of variables than HILDA wave 1 but a time effect could still be estimated from a Base model specified with the same variables for 1990 and 2001 in the two data sets. The comparisons between the estimates of the common Base model did not reveal any substantial change in the relative disadvantage of migrants between 1990 and 2001. While the estimated marginal effects on the probability of unemployment for migrants are slightly higher when estimated with the parameters of the 2001 model applied to the average characteristics of the 1990 sample (comparing columns 1 and 7 in table 6) – this increase is not statistically significant. Thus the relative employment disadvantage of migrants in Australia has not diminished in spite of greater emphasis on skilled migration in the post-1990 period. Also, no significant changes occurred in the period of residence effects for NESB migrants between 1990 and 2001.

The extensive HILDA data used to specify a richer Extended model of the risk of unemployment identifies important other correlates that are migrant specific as well as general. Within the limited set of additional correlates that were considered in this paper, the main migrant specific characteristics were specific county of birth effects. Even in the small sample of migrants in HILDA, migrants from Vietnam and South Asia had particularly higher predicted probabilities of unemployment. The effect of migrants having received their post school qualifications in Australia was surprisingly not significant.

Regarding characteristics applicable to all, the extra details on parental background and education were the most relevant. There was some clear

evidence of inter-generational effects on the risk of unemployment. Current unemployment of men was positively correlated with the unemployment status of their parents at the time when they (as children) were about 14 years old. Parental divorce in these formative years of the teenage child (aged 11 to 15) also led to higher subsequent risk of unemployment. The effect of parental divorce occurring at younger or older ages for the child were smaller and not statistically significant. Other significant effects on increasing the risk of unemployment were having a long term health condition and irregular labour force participation in the recent past.

On education, apart from the total years, specific qualifications (such as teaching or nursing and post graduate degrees), and having attended an independent private school tended to have additional effects lowering the risk of unemployment; but the estimated coefficients were not significant at standard test levels. Interaction dummies between years of schooling and migrant status were also not significant, suggesting that for the HILDA migrant sample their human capital is not generally viewed differently by the Australian labour market.

Comparisons of the results from the HILDA sample for the Base and Extended models also showed that the marginal effects identified with the conventional variables used in the Base model – such as age, years of schooling, period of residence for migrants – are quite robust. The marginal effects do not differ in major ways when additional correlates are included from the HILDA survey. The additional variables are however of interest in themselves and also help to improve the model fit and increase the successful prediction of outcomes. The overall fit of the Extended model, however, is still poor and this is partly a consequence of the restrictive functional forms that have been estimated. Because of the limited number of unemployed people in the ESB and NESB migrant groups, it was not meaningful to estimate separate regressions for the Australian born and the two migrant sub-samples, nor to include a large set of migrant interaction slope dummies in a single equation framework.

Another limitation of the estimation method of this paper is that it was not able to directly control for heterogeneity between migrants who have arrived in Australia at different times. The significant coefficients on the period of residence dummy variables will reflect both a pure effect of better assimilation over time, as well as any changes in the Australian labour market related skills of migrants who have arrived in different time periods. When data are available from several additional waves of the HILDA survey, one can separate out some of these cohort and time effects using panel data techniques; and that would be a useful direction to extend, and indeed further validate, the results of this paper by making full use of the distinctively longitudinal nature of HILDA.

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