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A Comparative Assessment of the Labour Market Success of Migrants in Australia

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ABSTRACT

One important indicator of the successful assimilation of immigrants is the comparison of the relative success of immigrants and of the native born population in finding employment under different macro economic regimes that affect the overall rate of unemployment in an economy. This paper analyzes the "risk" of unemployment of male immigrants to Australia relative to the native born for two different time periods in which the overall labour market characteristics and the pool of immigrants differ considerably. The two data sets used are the1990 Income and Housing Costs Survey conducted by the Australian Bureau of Statistics and the first wave of the Household Income and Labour Dynamics in Australia (HILDA) survey whose data refer primarily to the 2001 calendar year. The paper analyzes the correlates of unemployment at the individual level using logistic and probit regression models. It uses both a standard specification of the probability of being unemployed determined by individual and family level socio-economic characteristics (i.e. years of schooling and work experience, age, years since migration, etc.); and an extended model that is feasible only with the extra information available in the HILDA data set.

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 the standard and extended model specifications. There also are very distinct country of birth effects which persist even after controlling for the individual migrant's English language skills. The relative disadvantage of migrants has not diminished between the two time periods in spite of greater emphasis on skilled migration in recent years. By providing a clearer understanding of why and how the individual and subgroup level characteristics are correlated with the probability of an individual being unemployed, this paper gives valuable insights on how the Australian labor market functions, and, in particular on how it evaluates the employment prospects of specific immigrant groups.

JEL Classification: J64, J61, J15

Keywords: employment prospects of migrants, immigrant workers and assimilation, unemployment probabilities, immigrants in Australia

1. Introduction

Australia has one the highest proportion of people born overseas among major developed countries of the world,[1] and so there is an enduring research interest in the empirical analysis of 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 success achieved by the native born population. The key indicators of the labour market outcomes of migrants studied has been their participation in the labor force (Wooden, 1994), current employment status (Inglis and Stromback, 1986), earnings and wage adjustments (Beggs and Chapman, 1988), the match between migrants jobs and their skills and qualifications (Evans and Kelley, 1986), comparative performance of different migrant sub-groups (Junankar, Paul and Yasmeen, 2002).

This paper focuses on only one of these commonly used measures of the success of migrants in the labour market – the relative risk that a specific group of migrants face of being unemployed at a given point of time in comparison to the native born population as well as other groups of migrants. While this is only a single indicator, employment status (conditional on being in the labour force) is a certainly a key indicator of assimilation; and from the migrant's own perspective, perhaps the signal indicator of their aspirations in their new setting. It is also the easiest to measure accurately from surveys where respondents only have to provide a yes/no answer to their current employment status.

As Australia's migration policy is increasingly being channeled into skilled based selection streams, relying on indicators that value potential Australian labour market skills, it is still relevant to focus on the factors that explain the relative success of migrants in obtaining and holding jobs.

There is already a large literature on the assessing the relative labour market success of migrants in Australia, with some of the main early contributions summarized in Miller and Neo (1997). In the earlier literature, as exemplified by Inglis and Stromback (1986), the standard approach was to estimate binary dependent variable models, either as a logit or probit equation in a reduced form, to specify the relationship between the "risk" (or 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, as distinguished from the "determinants" of aggregate levels of unemployment in the economy, with the latter, of course, being associated with the macro-economic business cycle and fiscal and monetary policy settings.

One can interpret the analysis of the correlates of unemployment as a way to specify probability models which 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 aspect is highlighted by the recent focus on the increase in both jobless households and multiple-job households in the Australian (Dawkins, et. al., 2002), as in other developed country settings. A better understanding of why and how the individual and subgroup level characteristics are correlated with the probability of an individual being unemployed can provide clearer insights about how the Australian labor market functions, and in particular on how it evaluates the 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.

Such an approach is clearly distinguished from an alternative one that concentrates on assessing the labour market success of migrants using survey data collected only from migrant respondents. Australian surveys focused solely on migrants are not regularly available. But the recent availability of data from two cohorts of the Longitudinal Survey of Immigrants to Australia (LSIA) has led to a several new studies which look at the labour market outcomes of migrants during the early settlement period covered by the LSIA. Examples are Cobb-Clark and Chapman (1999), Cobb-Clark (2000), VandenHeuevel and Wooden (2000), and Richardson, et. al. (2001). These studies and reports exploit the richness and the longitudinal nature of the LSIA to provide a more careful and deeper analysis of the factors associated with the labour market success of migrants. There, however, are two important limitations that affect the nature of the analysis with the LSIA and related migrants-only datasets.

Firstly, they provide a window only on the very short term time frame for evaluating migrant labour market success.[2] Secondly, the comparisons are made only across migrant groups and time cohorts. A direct comparison of the labour market performance of migrants, relative to the native born, is not feasible from these surveys only. 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). 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).

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 time period of residence for migrants. This is the approach taken in this paper. While it is in the mould of the earlier studies by Inglis and Stromback (1986) and Miller and Neo (1997), it offers two important points of departure from the approach in these earlier studies.

Firstly, it provides a contemporary time framework by measuring relative employment success of migrants with a common model structure over two time periods, 1990 and 2001. Secondly, it exploits the richness of the recently released *Household Income and Labour Dynamics in Australia* (HILDA) survey data set to expand upon the specification of the regression models that have conventionally been used to compare the labour market success of migrants and the native born from earlier surveys. The 1990

period data set used is the ABS *Survey on Income and Housing Costs*. The scope and level of details of the data collected in these two surveys are very 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;[3]

(2) comparison in 2001 between a basic model specification and a richer one that is possible with the extra information in HILDA.[4]

It turns out that the macro-economic setting of aggregate unemployment in Australia in 1990 and 2001 was not that different.[5] Nevertheless comparison (1) above is relevant in the Australian context because of the deregulation regime 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. There has been a changing mix in the inflow of new migrants in recent years, as more emphasis has been placed on the skilled migrant stream. Over time, there is also a changing stock of migrants connected to policy settings from the more distant past and not just the recent setting of the 1990's. The 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.

Comparison (2) is also useful since it gives a way to validate the specification of the conventionally used models. It is a useful way to detect how robust the parameter estimates for the conventional models are to excluded variables on which data are not generally available; and indeed to test whether important 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 II briefly describes the recently released HILDA data set and the nature of the extra information in it 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 for this paper is constructed for both surveys. Section III presents the results for the comparison between 1990 and 2001 with a common logit model structure supported by both data sets. Section IV gives the results from the more detailed or Extended Model, based only the HILDA sample. Estimates are presented for both a logit and probit specification, with additional variables drawn from HILDA. These results are compared with those of the Base specification of Section III. The last section provides some additional discussion of the results, the limitations of the approach adopted, and some ways in which this work can be extended in future research.

2. HILDA Survey Data

The HILDA survey has been designed to address research interests in the three broad areas of income dynamics, labour market dynamics and family dynamics. But it has a considerably vast range of topics covered on life in general in Australia. [6] In addition to a standard survey form administered in each wave of the survey, special additional modules will be included in each wave. For Wave 1 extensive details were collected on the employment history of the respondents.

This paper is based only on the Wave 1 data so the longitudinal nature of HILDA is not exploited. Nevertheless the richness of coverage on employment 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 reference population for HILDA was all individuals living in private dwellings in Australia, with a few minor exceptions. The sample for Wave 1 of the HILDA Survey comprised 12,252 households selected from 488 different neighbourhood regions across Australia. There however was a substantial non-response rate which meant that interviews were successfully conducted only with 13,969 members aged 15 or above from 7,682 households, (a household response rate of 66 %).

Table 1.1 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 the migrants in the HILDA sample into those from so called "main English

speaking countries"[7] and others. Women are slightly over-represented in the HILDA sample and there are fewer migrants in proportion to ABS estimates for the Australian population in general.[8] A total of 3,556 persons aged 15 or over who were born overseas was enumerated in the HILDA sample. The equivalent number for Australian born persons is 10,431.

Table 1.1 Distribution of HILDA Individual Sample by Gender, Labour Force Status and Country of Birth

Count

Sex			DV: Country of birth - brief			
			Australia	Main english speaking	Other	Total
Male	DV: Labour force status	Employed	3471	504	565	4540
		Unemployed	242	40	69	351
		Not in the labour force	1190	225	316	1731
	Total		4903	769	950	6622
Female	DV: Labour force status	Employed	3112	390	483	3985
		Unemployed	186	29	43	258
		Not in the labour force	2212	337	555	3104
	Total		5510	756	1081	7347

The 1990 data source is the ABS Income and Housing Costs Survey of 1989/90 (henceforth referred to as IHCS 1990). [9] This is an even larger nationally representative household sample survey which counted over 32,000 individuals aged 15 or more in about 18,000 income units (families). Since the primary focus of the survey was on income sources, issues on current employment and other labor market related variables are not covered in much detail; but this data set is adequate for the basic model specification used in Section III.

The labor force status of all individuals at the time of the surveys is recorded in several categories. These were re-grouped into three states: currently not in the labour force; currently employed (including part time work); and currently unemployed. Current employment is established on the basis of work within the past week, while being in the labour force is established on the basis of current employment or actively looking for work in the last 4 weeks. The regression models reported 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.[10]

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 of such migrant women reporting to be unemployed. The cell size become even smaller when one breaks up the unemployed female migrants into the conventional distinction being from an English speaking background (26 of 409 report being unemployed) and non-English speaking background (35 of 494 are unemployed). While the proportion of unemployed persons in any representative sample of households or of the labour force will 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-sample.[11] Finally, the age and educational status restrictions are imposed even on the male sample since variations in employment status for elderly persons, who are likely to be formally retired but may still work at odd jobs, and for the very young who are still in fulltime education is not of much interest in a migrant *vs*. native born comparison.

The final breakdown of the restricted sample of men by their employed/unemployed status for both the HILDA and the 1990 IHCS survey is indicated in Table 1.2. The 1990 sample has almost 11,000 individuals, with a slightly higher proportion of migrants (at 27%) compared to 25% in the restricted HILDA sample.

Table 1.2 Sample Distribution of Employment Status (for Males aged 15-64) *

		AUST. BORN	MIGRANTS	TOTAL
IHCS 1990				
	Employed	7,329	2,686	10,018
	Unemployed	674	299	973

Total	**8,003**	**2,985**	**10,998**
% of Total	72.7%	13.4%	16.8%
Sample unemployment rate (unweighted)	8.4%	10.0%	8.8%

HILDA 2001

Employed	3,237	1,028	4,265
Unemployed	217	101	318
Total	3,454	1,129	4,583
% of Total	**75.4%**	**11.5%**	**13.1%**
Sample unemployment rate	**6.3%**	**8.9.%**	**6.9%**

* who are not in full time education
IHCS 1990 is the Income, Housing Costs and Amenities Survey, 1990 conducted by the ABS.

3. Base Model: Specifications and Results

The Base model is specified in terms of explanatory variables that are common to both the 1990 IHSC and HILDA data sets. Previous studies based on the Census and ABS household surveys have used a standard specification 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 has been that for a native born person, the probability of being unemployed is generally decreased by higher educational attainment, older age and more previous labour market experience, being currently married, and living in urban areas. Two important migrant specific variables that tend to decrease the PBU are longer period of residence and better English proficiency (Inglis and Stromback, 1986).

The 1990 IHCS, unfortunately, does not have any indicator of English language ability of migrants, either at the time of arrival or current at time of survey. We get around this problem by adopting the standard convention of classifying migrants into two sub-

groups, to capture a proxied effect of English proficiency. We define a sub-group of English speaking background migrants (ESB) and one of non-English speaking background migrants (NESB) on the basis of their country of origin. In the 1990 data set, this classification is only approximate since the publicly released version of that survey does not contain very detailed dis-aggregation on actual country of origin. [12]

Table 1.3 gives a summary of the variables created for the Basic model specification for estimating the PBU for the entire sample of men, as well as by sub groups of Australian born (AB), ESB Migrants and non-ESB migrants. The variable PLFEXN captures potential labour market experience of all individuals and is defined as (Age – years of schooling –5). A similar variable when applied to the Australian setting (AFLFEXN) has the same value as PLFEXN for the native born population; and for migrants, AFLEXN is the minimum of (years in Australia, or PLEXFN). The regional distribution of the sample has been captured along two different dimensions in the Base model. There is a dummy which has a value of 1 for a rural location; and the state of residence has been collapsed into a single dummy variable which has value of 1 for Western Australia, South Australia and Queensland. This particular re-grouping of the States and Territories was made by combining regions with similar dummy variable values in preliminary regressions. For migrants the period of residence is calculated both in actual years and as dummy categorical variables for different periods of arrival in Australia. For both data sets, a dummy variable is created to indicate arrival within 5 years of the survey date.

Table 1.3 Average Sample Characteristics by Sub-Group and Data Source: Base Model (mean values and proportions)

	IHCS (1990)					HILDA (2001)		
	AB	**M ESB**	**M NESB**	**All**		**AB**	**M ESB**	**M NESB**
Variables								
years of schooling	12.28	12.82	12.36	12.36		13.01	13.40	13.55
current age	35.9	39.7	42.3	37.3		37.9	42.3	41.1
potential labour market exp. (PLFEXN)	18.8	21.96	24.6	20.0		19.9	23.9	22.5
PLFEXN in Australia (A PLFEXN)	18.8	14.5	17	18.0		19.9	18.2	16.1
years in Australia		17.9	19.6				22.9	22.8
Dummy Variable proportions (%)								
never married	30	17	14	26		26	17	20
previously married	5	6	6	5		7	6	7
currently married	65	77	80	69		67	77	73
living in WA SA & QLD.	46	57	34	46		41	49	26
rural location	41	23	14	35		47	31	13
FOR MIGRANTS :								
arrived before 1965		23	36	8			15	14
arrived 1965-1984		61	48	15			48	35
arrived 1985 -1994		16	16	4			22	29
arrived 1995 or later							15	22
Sample N	8,003	1,473	1,512	10,988		3,454	529	600
% of total sample	72.7	13.4	16.8			75.37	11.54	13.09
No. unemployed	674	127	172	973		217	37	64
Percentage unemployed	8.44	8.62	11.40	8.86		6.28	6.99	10.67

AB = Australian born
M_ESB = Migrant – English speaking background
M_NESB = Migrant – non-English speaking background

Table 1.4 Extended Hilda Model Data Summary (mean values and proportions)

Variables	AB	M_ESB	M_NESB	ALL	Migrants
Country of birth_UK	-	0.586	0	* 0.068	0.275
Country of birth_NZ	-	0.278	0	* 0.032	0.130
Country of birth_otherES	-	0.136	0	* 0.016	0.064
Dummy: English first language (for non-ESB only)	-	-	0.153	-	0.153
Country of birth_Vietnam	-	0	0.073	* 0.010	0.039
Country of birth_China	-	0	0.042	* 0.005	0.022
Country of birth_S. Asia	-	0	0.118	* 0.015	0.063
Country of birth_otherNES	-	0	0.614	* 0.080	0.407
Age	37.9	42.3	41.1	38.9	41.7
Years of education	13.01	13.40	13.55	13.14	13.5
Dummy: never married	0.262	0.168	0.203	0.244	0.187
Dummy: previously married	0.067	0.064	0.070	0.067	0.067
Dummy: not reference person	0.417	0.401	0.335	0.404	0.366
Dummy: Arrived before 1965	0	0.153	0.142	* 0.036	0.187
Dummy: Arrived 1965 –84	0	0.478	0.347	* 0.101	0.301
Dummy: Arrived 1985 –94	0	0.219	0.293	* 0.064	0.244
Dummy: Indigenous person	0.018	0.000	0.000	0.014	0.000
Dummy Inner Regional	0.320	0.219	0.087	0.278	0.149
Dummy: Outer Regional	0.127	0.076	0.032	0.109	0.052
Balance of NSW	0.152	0.066	0.055	0.129	0.060
Melbourne	0.164	0.153	0.285	0.178	0.223
Balance of Victoria	0.089	0.034	0.017	0.073	0.025
Brisbane	0.091	0.140	0.058	0.093	0.097
Balance of Qld.	0.123	0.070	0.043	0.107	0.056
Adelaide	0.061	0.076	0.053	0.061	0.064
Balance of SA	0.034	0.019	0.003	0.028	0.011
Perth	0.065	0.136	0.083	0.075	0.108
Balance WA	0.032	0.045	0.015	0.032	0.029
Tasmania	0.030	0.019	0.007	0.026	0.012
Northern Territory	0.006	0.009	0.008	0.006	0.009
D: Parent employed when 14	0.942	0.958	0.907	0.939	0.254
D: Parents ever divorced	0.096	0.108	0.078	0.095	0.289
Sample N	3,454	529	600	4,583	1,129

** Note: For starred items, the average in the All column includes zero values for the other columns where the category is not relevant.*

Mean values for dummy variables represent the proportion in the total sample

In both surveys, although the total sample size is large, there is an unbalanced distribution of the dependent variable because the proportions of the men who are unemployed are small, as is to be expected. The sample proportion of unemployed person shows a big difference between the ESB and NESB migrant groups in both data sets. The proportion unemployed for the ESB group (8.62% in 1990 and 7% in 2001) is very close to the proportion for the AB group (8.44% and 6.28%, respectively). The corresponding proportion for the NESB group is 11.4% in 1990 and 10.67% in 2001. This suggests that the more relevant distinction in interpreting the PBU of migrants may be between the NESB and ESB group rather than just between the AB and an aggregated migrant group.

Table 1.3 also indicates that there are major differences in the average characteristics of the three sub-groups. In both data sets, compared to the AB group, the migrant groups are slightly older, and a higher percentage are currently married and live in urban areas. While there are differences on other characteristics also, it is important to keep these three in mind because in each case (higher age, more urban based, and higher proportion being currently 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.

The logit regression results for the full sample of males, using only dummy intercept variables for the two migrant groups, are given in Table 2. The dependant variable is coded 1 for persons who are unemployed, so a positive coefficient indicates an increase in the probability of being unemployed. All standard variables used in the Base model specification reported in Table 2 are significant.[13] The Base model using the HILDA 2001 sample then repeats the same logit model specification with variables defined in a similar way as in the 1990 estimation.

The results for 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 non-ESB migrant dummy is substantially larger than for the ESB dummy variable. The hypotheses that these two coefficients are the same (MESBD = MNESBD) is rejected in both samples, as indicated in Table 2. 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 non-ESB group compared to

the ESB group. (To compute how much higher, one needs to consider not the size of the β coefficients of Table 3 but the marginal effects (δ) computed in Table 3, which is discussed subsequently).

In Table 2, the signs of all the other variables for the 1990 data are as expected. The PBU decreases with years of schooling, with age (but at a decreasing rate since the age squared term has a positive coefficient), and with the period of residence for migrants. Variables which increase the PBU are being unmarried or previously married, being a dependant person in the family (i.e. not the family reference person), and living in rural areas. The state dummy captures the effects of local labor market conditions. Persons living in Western Australia, Southern Australia or Queensland had significantly higher PBU's in 1990, but this variable is not significant in this particular form in the 2001 estimates from HILDA.

A noteworthy feature of Table 2 is that even though all the variables are highly significant, the goodness of fit indicators are quite poor. The *pseudo* R^2 is around 0.1, and the classification table of the predicted and observed values of the dependant variable indicates that the Base model almost completely fails to correctly assign any of the actually unemployed people. While most of the employed persons are correctly predicted by the model to be employed, only about 1% of the unemployed is correctly predicted to be unemployed in both the 1990 and 2001 estimates.

The likelihood ratio test, however, rejects the hypothesis that all explanatory variables, apart from the constant, are insignificant. Hence, although the overall rate of correct predictions for the actually unemployed men is very low in this Base model specification, it is still statistically different from the naïve model that could be calibrated, with only a constant term, to predict that everyone in the sample would be employed.

Table 2 Base Model Logit Regression Results – IHCS and Hilda sample

Full Sample
Dependant Variable=1 for Unemployed

	IHCS 1990				HILDA 2001			
Regressors	**β**	**s. e.**	**Wald χ 2**	**signif.**	**β**	**s. e.**	**Wald χ 2**	**signif.**
Migrant ESB	0.6913	0.1656	17.43	0.000	0.9102	0.2713	11.26	0.001
Migrant non-ESB	1.157	0.1601	52.23	0.000	1.4005	0.2325	36.27	0.000
Age	-0.17	0.0191	79.22	0.000	-0.0926	0.0328	7.97	0.005
Age squared	0.002	0.0002	100.00	0.000	0.0011	0.0004	6.96	0.008
Years of education	-0.1929	0.0177	118.77	0.000	-0.2281	0.0309	54.56	0.000
D: never married	0.4843	0.1029	22.15	0.000	1.0169	0.1627	39.06	0.000
D: previously married	1.087	0.1283	71.78	0.000	0.8710	0.2202	15.64	0.000
D: not reference person	0.6717	0.2015	11.11	0.001	-0.1052	0.1345	0.61	0.434
D: Rural Location	0.1936	0.0754	6.59	0.010	0.1428	0.1307	1.19	0.275
D: In SA, Qld or WA	0.1502	0.0702	4.58	0.032	0.3344	0.1227	7.43	0.006
D: Arrived < 1965	-0.8456	0.2055	16.93	0.000	-1.0925	0.4401	6.16	0.013
D: Arrived 1965 -84	-0.3085	0.1632	3.57	0.059	-0.6165	0.2784	4.91	0.027
D: Arrived 1985 -94					-0.5637	0.3030	3.46	0.063
Constant	2.546	0.4049	39.54	0.000	1.2945	0.7389	3.07	0.080
Test MESBD = MNESBD			6.51	0.000			4.52	0.033
log likelihood	-2996.3				-1040.94			
LR statistics for testing all slope parameters insignif.	chi2(13)		582.0	0.000			228.42	0.000
Psuedo Rsq.			0.09		0.10			

CLASSIFICATION TABLE for LFSTATUS

	PREDICTED				PREDICTED		
OBSERVED	Employ.	Unempl.		OBSERVED	Employ.	Unempl.	
10015 Employed	9993	22	99.78%	4265 Empl.	4264	1	100.0%
973 Unempl.	963	10	1.03%	318 Unempl.	315	3	0.94%
Percent correct prediction -overall			91.0%				93.1%

Note: "D" indicates dummy variable.

Table 3 presents the estimates of the marginal effect of the regression variables on the probability of being unemployed. These marginals are computed in terms of the percentage point changes in the PBU when evaluated at the mean of the data.[14] The magnitude of the marginal effects reported for the ESB and non-ESB 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 a metropolitan area of the states other than SA, Qld and WA, and who has arrived in Australia in the last five years or so prior to the survey.[15]

Table 3 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 sample but applied to the average data value of the 1990 survey. The middle set of estimates of the marginal effects, reported in column (3), indicate that, holding the characteristic 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 3 are higher than those in column 1 for both migrant sub-groups). However, the standard errors of these estimates of the marginal effects are large enough to reject the hypothesis that the increased disadvantage of migrants is a statistically significant. The main inference is rather that over time the pattern of a predicted higher PBU's for migrants remains more or less constant, and that at each given point in time, there is a statistically significant difference in the PBU's for ESB and non-ESB migrants.

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. The results of such a comparison are given in Table 4, where the reference person chosen is someone who has the sample average values on the continuous variables in the model but has all the dummy variable categories turned off. This Table then shows the predicted PBU for such a person as he changes from the excluded category to the indicated category for each one of the dummy variables turned on one at a time. For instance, as indicated in the first row of Table 4, using the 1990 IHCS parameter estimates, for the Australian born reference person, the predicted PBU is 3.6%. If this reference person is now converted to an ESB migrant who entered Australia after 1985, his predicted PBU is increased to 6.94%. . Similarly, for a non-ESB migrant with these same reference characteristics, the

predicted PBU increases to 10. 62% - which is nearly three times higher than the predicted PBU for the Australian born reference person. Consistent with the pattern of marginal effects noted in Table 3, the gap in the predicted PBU's between a native born and the two types of migrants increases slightly in the estimates based on the 2001 HILDA sample when compared to the 1990 estimates.

Table 4 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 (which is the excluded marital status dummy) and never married men, as well as between currently married and previously married men. Divorced (or previously married) non-ESB migrants appear to be particularly disadvantaged since they record the highest level of predicted PBU in both samples on the basis of the model specification of Table 2. One other significant finding in Table 4 is the manner in which the predicted PBU for migrants decline substantially with a longer period of residence for both ESB and non-ESB migrants. Looking at the category of ESB migrants who arrived before1965, their predicted PBU are less than that for the reference Australian born person in both the 1990 and 2001 estimates.

Table 3 Base Model Logit Regression – Marginal Effects (in percentage points)

Full Sample
Dependant Variable=1 for Unemployed

	IHCS 1990		HILDA 2001			
	1	**2**	**3**	**4**	**5**	**6**
Regressors	marginal effects (δ) * 100 at Xbar(IHCS)	s. e.	marginal effects (δ) * 100 at Xbar(IHCS)	s. e.	marginal effects (δ) * 100 at Xbar(Hilda)	s. e.
Migrant ESB	**5.92**	1.07	**7.82**	**3.05**	**6.14**	2.44
Migrant non-ESB	**11.15**	1.03	**13.60**	**3.21**	**11.12**	2.71
Age	-1.19	0.13	-0.59	0.22	-0.45	0.16
Age squared	0.01	0.002	0.01	0.002	0.01	0.002
Years of education	-1.22	0.11	-1.46	0.21	-1.11	0.14
Dummy: never married	3.69	0.78	8.16	1.48	6.39	1.26
Dummy: previously married	11.32	1.31	7.83	2.59	6.00	2.02
Dummy: not reference person	4.93	1.49	-0.67	0.85	-0.51	0.64
Dummy: Rural Location	1.36	0.53	0.93	0.86	0.70	0.65
Lives in SA,Qld or WA	1.04	0.48	2.17	0.82	1.68	0.64
Dummy: Arrived before 1965	-4.35	1.04	-4.81	1.25	-3.47	0.86
Dummy: Arrived 1965 -84	-1.94	1.02	-3.29	1.23	-2.42	0.88
Dummy: Arrived 1985 -94			-2.84	1.21	-2.21	0.95
Combined effect of a marginal change in age	*-0.189*		*-0.079*		*-0.060*	
Predicted probability level at mean of data	6.87%		6.85%		5.12%	

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.

Table 4 Base Model Predicted Probability of Being Unemployed for various Categorical Groups (in percentage)

Sample reference person: 37.3 years
12.36 years of schooling
is currently married
lives in a capital city in
(NSW, VIC, ACT, NT or TAS)

Using IHCS 90 Parameter estimates

	AB	M_ESB	M_NESB
by country of birth	3.60	6.94	10.62
Change other characteristics			
being never married	5.72	10.80	19.01
being previously married	9.98	18.12	26.06
does not live in capital city	4.34	8.30	12.61
lives in WA , SA, QLD.	4.16	7.98	12.14
*for migrants** :			
arrived before 1965		3.10	4.68
arrived 1965-84		5.20	8.03

Using Hilda 2001Parameter estimates

	AB	M_ESB	M_NESB
by country of birth	2.99	7.11	11.11
Change other characteristics			
being never married	7.85	17.46	25.67
being previously married	6.85	15.46	22.99
does not live in capital city	3.43	8.11	12.60
lives in WA , SA, QLD.	4.12	9.66	14.86
*for migrants** :			
arrived before 1965		2.50	4.02
arrived 1965-84		3.97	6.32
arrived 1985-94		4.17	6.64

*Note reference category for migrants in IHCS estimates is someone who arrived after 1985. In the HILDA estimates, the reference migrant is someone arriving after 1995.

4. Extended Model: Specification and Results

The results in the previous section show that, while the individual coefficients and marginal effects are significant, the inference from the goodness of fit of the logit regressions is that the Base model does not adequately pick out the unemployed men in the sample. This indicates that the Base model is likely to be missing important additional dimensions of the correlates of unemployment. In particular, the Base model is not picking up on the fact that many persons with otherwise favourable employment prospects (in terms of age, years of schooling or marital status) are unemployed. Improvements in model specification should then consider factors which help explain why many of the individuals with favourable characteristics on the Base model variables are unemployed.

In these section we present an extended model specification which is to be estimated from the 2001 HILDA dataset, and which can be compared with the Base model. This type of comparison is useful because it allows one to check how robust are the parameters estimates and the underlying marginal effects from a restricted set of regressors with limited data, when compared to alternative model specifications that become feasible with a special data set such as HILDA.

The amount of 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, we sought to incorporate the extra variables that addressed the following characteristics of individuals and their region of residence:

<u>for migrants</u>: detailed data on country of origin, and schooling in Australia;
(for migrants from non-ESB countries only) whether at a personal level English was their first language;

<u>for all respondents</u>:
additional details on the year and type of schooling (i.e. public or alternative private);
information about parents and their unemployment and marital history;
greater detail on regional location, which goes beyond the standard State/Territory of residence & rural/capital city location;

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 HILDA survey.[16] But the main interest here is not to present a comprehensive model 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 III 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 in particular. 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 non-ESB migrants. These are shown to be important correlates of migrant unemployment status in studies using the LSIA sample (Cobb-Clark, 2000).

Details of these additional variables available from HILDA that were included in the Extended model specification are given in Table 1.4, where their sub-group averages are also reported. Type of school and whether the last years of schooling were in Australia or abroad were not significant variables and so have been dropped.

Table 5 presents 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 non-ESB migrants.[17] In version 1 of Table 5, which has only the standard migrant classification as ESB and NESB, together with a dummy variable to indicate whether a migrant from a non-ESB country reports English as their first language, the ESB and NESB coefficients continue to be highly significant and positive. The English language dummy for non-ESB migrants is negative, as expected, but surprisingly this coefficient is not significant at conventional levels. 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 5. What is surprising is the negative effect of having English as a first language is also 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 whom, as expected, report English as a first language.[18]

Table 5 Selected Parameter Estimates of Regressions for the Extended Model with Hilda Data

Dependant Variable=1 for Unemployed

	version 1			version 2			version 3			version 4		
	β	s. e.	significant.	β	s. e.	significant.	β	s. e.	significant.	β	s. e.	significant.
Logit Regressions												
Migrant- ESB	1.027	0.276	0.000							1.040	0.279	0.000
Country of birth_UK				1.173	0.349	0.001	1.180	0.348	0.001			
Country of birth_NZ				0.848	0.368	0.021	0.889	0.368	0.016			
Country of birth_otherES				1.203	0.512	0.019	1.239	0.511	0.015			
Migrant- non-ESB	1.589	0.245	0.000									
Country of birth_Vietnam				1.752	0.532	0.001	1.764	0.531	0.001	1.726	0.529	0.001
Country of birth_China				0.761	1.077	*0.480*	0.748	1.077	*0.487*	0.749	1.077	*0.487*
Country of birth_S. Asia				1.515	0.495	0.002	1.313	0.483	0.007	1.482	0.495	0.003
Country of birth_otherNES				1.643	0.260	0.000	1.573	0.256	0.000	1.618	0.258	0.000
English First Language (Dummy applies only for NESB migrants)	-0.732	0.510	0.151	-0.713	0.519	0.169				-0.694	0.516	0.178
Probit Regressions												
Country of birth_UK				0.631	0.177	0.000						
Country of birth_NZ				0.456	0.191	0.017						
Country of birth_otherES				0.599	0.263	0.023						
Country of birth_Vietnam				0.918	0.284	0.001						
Country of birth_China				0.576	0.467	*0.217*						
Country of birth_S. Asia				0.813	0.252	0.001						
Country of birth_otherNES				0.869	0.136	0.000						
English First Language				-0.350	0.253	0.167						

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 Tables 6 and 7 for a logit and probit model, respectively. When computed 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): 8.7 for UK migrants, 5.7 for New Zealand, 9.5 for other ESB migrants, 17.7 for Vietnamese migrants, 5.0 for Chinese and 13.8 for South Asian and 14.6 for other NESB migrants who do not report English as a first language. The 95% confidence intervals for these point estimates of the marginal effects at the mean show that all individual country of birth effects are significantly different from zero, except for China.[19]

The other notable PBU increasing large marginal effects in Table 6 are for Australian native born indigenous men (11% points), specific regional locations, i.e. Tasmania (8 points), and single persons (6.1 points).

All other variables in version 2 of the Extended model (in Table 6) have expected signs (or are insignificant if not of the expected sign). Age has a significant quadratic effect, 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 PBU for the respondent, no matter what his current age now. Parental divorce has an opposite effect in increasing PBU, but the coefficient is significant only around an 11% level.

Comparing the logit estimates of the marginal effects from the Base model (column 5 of Table 3) and the estimates for the Extended model in Table 5, the results for the common variables are very similar. The addition of the extra variables in the Extended model, while being significant regressors, does not 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.

Table 6 Extended Hilda Data Model Complete Regression Results: Logit

version 2 (with main country/region of birth dummies)

Dependant Variable=1 for Unemployed

	Parameters			**Marginal effects**		
Regressors	**β**	**s. e.**	**signific.**	**δ * 100**	**s. e.**	**signific.**
Country of birth_UK	1.173	0.349	0.001	8.73	3.826	0.022
Country of birth_NZ	0.848	0.368	0.021	5.67	3.376	0.093
Country of birth_otherES	1.203	0.512	0.019	9.54	6.189	0.123
Dummy: English first language	-0.713	0.519	0.169	-2.45	1.281	0.055
Country of birth_Vietnam	1.752	0.532	0.001	17.70	9.141	0.053
Country of birth_China	0.761	1.077	0.480	4.99	9.527	0.601
Country of birth_S. Asia	1.515	0.495	0.002	13.77	7.358	0.061
Country of birth_otherNES	1.643	0.260	0.000	14.16	3.528	0.000
Age	-0.092	0.033	0.005	-0.43	0.154	0.006
Age squared	0.001	0.000	0.008	0.01	0.002	0.008
Years of education	-0.208	0.031	0.000	-0.96	0.140	0.000
Dummy: never married	1.017	0.166	0.000	6.11	1.231	0.000
Dummy: previously married	0.863	0.222	0.000	5.67	1.943	0.004
Dummy: not reference person	-0.112	0.137	0.414	-0.51	0.622	0.410
Dummy: Arrived before 1965	-1.236	0.458	0.007	-3.55	0.765	0.000
Dummy: Arrived 1965 –84	-0.665	0.296	0.024	-2.45	0.863	0.004
Dummy: Arrived 1985 –94	-0.596	0.314	0.057	-2.20	0.913	0.016
Dummy: Indigenous person	1.314	0.326	0.000	10.97	4.287	0.010
Dummy Inner Regional	-0.192	0.207	0.354	-0.86	0.891	0.336
Dummy: Outer Regional	0.081	0.254	0.751	0.38	1.246	0.757
Balance of NSW	0.348	0.283	0.220	1.81	1.656	0.273
Melbourne	0.155	0.223	0.487	0.75	1.129	0.506
Balance of Victoria	0.795	0.328	0.015	5.05	2.741	0.065
Brisbane	0.569	0.254	0.025	3.27	1.768	0.065
Balance of Qld.	0.851	0.284	0.003	5.40	2.362	0.022
Adelaide	0.448	0.281	0.111	2.48	1.840	0.177
Balance of SA	0.881	0.399	0.027	6.00	3.755	0.110
Perth	0.371	0.268	0.167	1.98	1.642	0.227
Balance WA	0.423	0.401	0.292	2.35	2.636	0.373
Tasmania	1.111	0.409	0.007	8.38	4.562	0.066
Northern Territory	0.664	0.687	0.334	4.16	5.608	0.458
D: Parent employed when 14	-0.532	0.192	0.006	-3.06	1.350	0.023
D: Parents ever divorced	0.300	0.187	0.109	1.55	1.079	0.150
Constant	1.211	0.780	0.121			
Joint Test : all country of birth parameters insignific.	*44.86*	*chi2(7)*	*0.000*			
log likelihood	*-1017.96*					
LR statistics for testing all slope parameters insiginfic.	*274.36*	*chi2(33)*	*0.000*			
Pseudo Rsq.	*0.119*					

Table 6 continued

CLASSIFICATION TABLE for Employment. status

		PREDICTED		% Correct
OBSERVED		Employ.	Unempl.	Prediction
4265	Employed	4257	8	99.8%
318	Unemploy.	310	8	2.52%
4583	Total	4567	16	93.1%

Table 7 Extended Hilda Data Model Complete Regression Results: Probit

version 2 (with main country/region of birth dummies)

Dependant Variable=1 for Unemployed

	Parameters			**Marginal effects**		
Regressors	**β**	**s. e.**	**significic.**	**δ * 100**	**s. e.**	**significic.**
Country of birth_UK	0.631	0.177	0.000	9.98	3.872	0.010
Country of birth_NZ	0.456	0.191	0.017	6.60	3.637	0.070
Country of birth_otherES	0.599	0.263	0.023	9.68	5.966	0.105
Dummy: English first language	-0.350	0.253	0.167	-2.74	1.430	0.055
Country of birth_Vietnam	0.918	0.284	0.001	18.20	8.545	0.033
Country of birth_China	0.576	0.467	0.217	9.23	10.448	0.377
Country of birth_S. Asia	0.813	0.252	0.001	15.06	6.929	0.030
Country of birth_otherNES	0.869	0.136	0.000	15.27	3.437	0.000
Age	-0.051	0.017	0.003	-0.52	0.174	0.003
Age squared	0.001	0.000	0.004	0.01	0.002	0.004
Years of education	-0.104	0.015	0.000	-1.08	0.156	0.000
Dummy: never married	0.500	0.082	0.000	6.41	1.259	0.000
Dummy: previously married	0.418	0.112	0.000	5.76	1.957	0.003
Dummy: not reference person	-0.065	0.068	0.337	-0.67	0.687	0.331
Dummy: Arrived before 1965	-0.674	0.225	0.003	-4.18	0.736	0.000
Dummy: Arrived 1965 -84	-0.395	0.154	0.010	-3.15	0.929	0.001
Dummy: Arrived 1985 -94	-0.339	0.162	0.037	-2.74	1.002	0.006
Dummy: Indigenous person	0.719	0.185	0.000	12.60	4.740	0.008
Dummy Inner Regional	-0.108	0.102	0.292	-1.07	0.976	0.273
Dummy: Outer Regional	0.010	0.129	0.938	0.10	1.354	0.939
Balance of NSW	0.200	0.138	0.149	2.33	1.825	0.202
Melbourne	0.107	0.108	0.323	1.17	1.247	0.349
Balance of Victoria	0.407	0.162	0.012	5.55	2.822	0.049
Brisbane	0.281	0.126	0.026	3.50	1.849	0.058
Balance of Qld.	0.448	0.141	0.001	6.15	2.501	0.014
Adelaide	0.195	0.143	0.174	2.31	1.929	0.231
Balance of SA	0.459	0.203	0.024	6.68	3.957	0.091
Perth	0.181	0.133	0.174	2.12	1.755	0.226
Balance WA	0.205	0.202	0.309	2.48	2.825	0.380
Tasmania	0.549	0.210	0.009	8.50	4.501	0.059
Northern Territory	0.322	0.369	0.383	4.29	6.143	0.485
D: Parent employed when 14	-0.300	0.103	0.004	-3.84	1.599	0.016
D: Parents ever divorced	0.153	0.096	0.112	1.75	1.209	0.149
Constant	0.567	0.396	0.153			
Joint Test : all country of birth parameters insignific.	*45.15*	*chi2(7)*	*0.000*			
log likelihood	*-1016.76*					
LR statistics for testing all slope parameters insiginfic.	*276.77*	*chi2(33)*	*0.000*			
Pseudo Rsq.	*0.120*					

Table 7 continued

CLASSIFICATION TABLE for Employment. status

		PREDICTED		% Correct
OBSERVED		Employ.	Unempl.	Prediction
4265	Employed	4258	7	99.8%
318	Unemploy.	312	6	1.89%
4583	Total	4570	13	93.0%

The marginal effects for the Extended model computed from the logit and probit specifications also do not vary substantially. Although the actual values of the estimates differ, because the logit and probit have different densities in the tails of their distribution (Greene, 1997), the relative pattern of which variables have the most impact on the estimated PBU is mostly unchanged for the logit and probit models of Tables 6 and 7.

Table 8 gives values of the actual predicted levels of the PBU for individuals with different characteristics. For the sample reference person with all the dummy variable categories turned off, the predicted PBU is 3.54% under logit and 3.79 % under probit estimates for an Australian born sample reference person as indicated. Under both sets of estimates, the highest PBU is recorded for migrants from Vietnam, and for other NESB migrants without English as a first language. The levels of the predicted PBU for men from ESB countries are also relatively high, but one should note the PBU values indicated in the country of birth rows of Table 8 are in reference to a migrant who has arrived in Australia in 1995 or afterwards. Ignoring the country of birth distinction, the PBU for migrants who have arrived at alternative time periods are substantially lower. [20]

Table 8 Extended Hilda Model Predicted Probability of Being Unemployed for various Categorical Groups (in percentage)

Sample reference person :	Australian born, 39 years old 13 years of schooling is currently married lives in Sydney/ACT at least one parent working when ref person aged 14 parents never divorced	
Probability of unemployment for Reference person	*3.54*	*3.79*
Predicted probabilities of being unemployed (%) with other dummy categories being active	**Logit**	**Probit**
Country of birth_UK	10.59	12.62
Country of birth_NZ	7.89	9.34
Country of birth_otherES	10.88	11.97
Country of birth_Vietnam	17.45	19.53
Country of birth_China	7.28	11.50
Country of birth_S. Asia	14.30	16.77
Country of birth_otherNES	15.93	18.23
Country of birth_otherNES + English as first language	8.50	10.43
Dummy: never married	9.21	10.10
Dummy: previously married	8.00	8.72
Dummy: not reference person	3.18	3.28
Dummy: Indigenous person	12.01	14.53
Dummy Inner Regional	2.94	2.98
Dummy: Outer Regional	3.82	3.87
Balance of NSW	4.94	5.75
Melbourne	4.11	4.75
Balance of Victoria	7.51	8.55
Brisbane	6.08	6.75
Balance of Qld.	7.91	9.21
Adelaide	5.43	5.69
Balance of SA	8.13	9.40
Perth	5.04	5.54
Balance WA	5.30	5.81
Tasmania	10.02	10.99
Northern Territory	6.65	7.30
Dummy: Parent employed when 14	2.11	1.89
Dummy: Parents ever divorced	4.72	5.23
One extra year of education for Reference person	2.89	3.00

5. Conclusion

This paper has shown that the probability of unemployment for recent migrants remains consistently higher than for an average native born Australian. While the PBU for migrants does decrease substantially with period of residence, it is only among the select subgroup of migrants who had arrived prior to 1965 that PBU's are comparable with the Australian born. When comparing like with like for similar reference person categories, the PBU for both ESB and non-ESB migrants are persistently higher than for the native born in both the 1990 ICHS and the 2001 HILDA sample.

The comparisons between the estimates of 1990 and 2001 did not reveal any substantial change in the relative disadvantage of migrants. While predicted PBU's for the reference group of migrants – the most recently arrived ones– are slight higher when estimated with the parameters of the 2001 model applied to the average characteristics of the 1990 sample (Table 3) – this increase is not statistically significant.

Comparisons of the estimates based on the 2001 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. Within the limited set of additional correlates that were considered in this paper, the extra regional dis-aggregation and parental characteristics were the most relevant. Additional information on the type of

schooling was not significant in the functional forms estimated. An interaction dummy term between years of schooling and migrant status was also not significant.

A related conclusion is that the inclusion of the additional correlates in the Extended model did not greatly improve the model fit in terms of the predictive power of the model. There is still an overwhelming tendency in the estimated models to predict that everyone should be employed. This is a clear indication of the individual specific heterogeneity that we are not able to pick up even with the extra information of the HILDA data set. The poor predictive performance of the model 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 non-ESB 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 for most of the variables in a single equation framework.

Another limitation of the estimation method adopted in this paper is that we are not able to 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 at different periods. When data are available from additional waves of the HILDA survey, we can partial out some of these cohort and time effects and that would be a useful direction to extend and indeed and further validate of results of this paper.

Another extension would be adopt a multinomial choice framework through which labour force participation and employment status could be jointly modeled and the relative labour market success of migrants compared to the native born along both dimensions. Such a framework will be particularly relevant in analyzing the labour market success of migrants women even with the small cell sizes of the HILDA data in order to exploit the extra richness of individual details available in HILDA that is not available in the Census and other ABS surveys which have been traditionally used to in the past to analyze the comparative labour market success of migrants in Australia.

Endnotes

[1] This proportion is almost 28%; see ABS estimates from the *Monthly Population Survey* for October 2002.

[2] The first cohort of the LSIA, for instance, was interviewed in waves between 6 months and 3 years 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 only upto 18 months since arrival. See Richardson, *et. al*. (2001) for a description of the LSIA survey and the different outcomes recorded for the two cohorts.

[3] Doing comparative analyses from two surveys conducted by two different organizations could 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 that result 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*, page 10). For the main question addressed in this paper – the labour market status of survey respondents – as far as this author is aware the definitional conventions used are similar in the two surveys.

[4] This second level comparison also turns out to be one way of evaluating the usefulness of the extra information collected in HILDA at considerable cost.

[5] National level unemployment rates were between 6.5 and 7% in most of the time period of both surveys.

[6] Sample respondents, in fact, know HILDA as the Living in Australia Survey.

[7] 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.

[8] Table 3 in the HILDA Survey *Annual Report 2002* makes an explicit comparison of the representative-ness of the HILDA sample with respect to ABS estimates for the general population.

[9] The complete reference to the data set is the *Survey of Income and Housing Costs and Amenities 1990*, conducted by the Australian Bureau of Statistics.

[10] 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. Previous studies have also focused mainly on such a binary choice framework. While it would be useful to extend the analysis to a multi-nominal choice setting which also includes comparative analyses of the decision to be in the labour force as well, the binary structure of whether employed or unemployed, conditional on being in the labour force, is not overtly restrictive when considering the labour market outcomes for men only, as is the case in this paper.

[11] Small cell size problems also occurs for male sample where in the HILDA that has been restricted 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.

[12] The classification for country of origin in the 1990 IHCS data set differs slight from the HILDA data set classification described in Endnote 6 above because individual country of origin codes are not consistently provided in the public release version of the IHCS. In the 1990 data the assignment into the ESB and NESB groups, we have made is as follows :

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

[13] PLEXN and AFLEXN (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.

[14] Table 3 presents the marginal effects evaluated at the mean of the data which give rise to a predicted probability of unemployment at the mean, as indicated in the last row of Table 3. 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 and characteristics fixed at the sample mean of the data.

[15] These other characteristics of the migrant, to whom the marginal effect of the ESB and non-ESB dummy variables in Table 3 applies, are derived from the excluded categories on the other dummy variables included in the regression.

[16] On other specific variable of interest as a correlate of unemployment - and one that could vary substantially between native born and migrants - was membership of a trade union. But in the HILDA survey, this question is asked only of those who were currently employed (perhaps being mindful of the analytical problem of whether to interpret trade union membership as a c*onsequence* of having a job rather than being an independent correlate).

[17] The full regression results for both a logit and probit estimation of version 2 of the model in Table 5 are presented subsequently in Tables 6 and 7. All versions of the models reported in Table 5 have the same set of other additional variables that are listed in the complete results of version 2 in Tables 6 and 7.

[18] The estimates of individual country of birth coefficients should be treated with some 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 1 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 NES migrants. For migrants in the other_NESB country categories, only 5 out of 92 (5.4%) are unemployed among those who report English as a first language, while this proportion is substantially higher, 59 out of 508 (11.6%) for other_NESB migrants who do not report English as a first language.

[19] Confidence intervals for the marginal effects are not reported in Tables 6 and 7. They have been computed from the "mfx" command in Stata.

[20] These are not indicated in Table 8 since the estimates in Table 8 are derived by turning on one dummy variable coefficient at a time. We can repeat the same type of calculation with respect to a reference person by turning on two or more dummy variables to give him any specific characteristics. The predicted PBU can then be estimated using the values of the β coefficients and the X variable values.

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