14 Male Immigrant Wage and Unemployment Experience in Australia

John J. Beggs and Bruce J. Chapman

This paper analyzes the relative labor market success of immigrants using the 1 percent sample of the 1981 Australian Census, data that have previously been exploited for this purpose. Our major contribution lies in the adoption of flexible estimation techniques. This allows two fundamental insights into the operation of the Australian labor market, both of which are related to the role of education as a determinant of immigrant success.

First, it is important to allow the wage effects of labor market experience and ethnicity to differ by education levels. Second, it is clear that the role of schooling in the determination of unemployment can be adequately understood only by estimating relationships in a disaggregated way. The clear and consistent result from our methods is that, relative to similarly educated natives, immigrants with the highest levels of education receive the lowest wages and experience the highest unemployment. We do not explore fully the reasons for these outcomes; we do, however, touch on some possibilities.

Apart from the insights allowed through disaggregated estimation of the role of schooling, the paper offers the following technical innovation. For one of the first times, the results of non-parametric estimations of wage functions are presented. The major benefit of this approach is the flexibility afforded, but the method is not unambiguously superior to OLS regression analysis. It is at least clear that useful (graphical) interpretation of casual mechanisms may be highlighted through the use of non-parametric techniques.

The data used are cross-sectional; consequently, estimations could be contaminated by important problems associated with the unobserved ability of immigrants. Because this possibility is highly relevant to interpretation of results, some effort is directed to understanding the empirical significance of

John Beggs is associate director, Daiwa Securities Australia Ltd., responsible for the management of the Funds Management Division and Research Group. Bruce Chapman is senior fellow, Economics Department, Research School of Social Sciences, Australian National University.

this potential. It is to the role of unobserved ability in cross-sectional data that we turn first.

14.1   Examining the Usefulness of Cross-sectional Data

Several difficulties arise in the analysis of relative immigrant labor market outcomes using cross-sectional data. The concern is that immigrant cohorts differing in length of residency are also dissimilar in terms of unobserved ability or motivation. If this is the case, some parameters of major interest, such as the elasticities found between length of residency and both wages and unemployment, cannot be estimated without bias.

There are two obvious dimensions to the unobserved ability issue noted above. First, differences in economic conditions or government policy will undoubtedly affect the average quality of the immigrant pool entering in particular years. Second, the act of immigration is reversible, and a sizable (but variable) proportion of immigrants from different countries eventually leaves the new country. If the probability of remigration is correlated with (unobserved) immigrant quality, cross-sectional data will misrepresent underlying relationships, at least as indicators of expected immigrant success.

These issues have been examined with U.S. data by both Borjas (1985) and Chiswick (1986). Borjas argues that considerable variation exists in the ability of immigrant cohorts, suggesting bias in the interpretation of the effect of period of residence on wage growth. Chiswick's study implies that remigration does not markedly affect wage estimates.

Since the wage and unemployment analyses reported in this paper use a single cross section of data, it is pertinent to attempt to establish the empirical significance of the unobserved quality issue in the Australian context. Both the quality of entering cohorts and the effect of remigration are examined below using wage data. It is important to stress, however, that the unobserved ability issue applies as much to unemployment as it does to wages, the focus on the latter at this stage being a consequence only of data availability.

The methodology suggested by Borjas (1985) to examine immigrant quality may be applied to Australian data. The approach compared predicted wages of different and similar immigrant cohorts to those of natives and can be used to gain insight into both the returns to local experience for a particular cohort of immigrants and the differences between immigrant cohorts in unmeasured wage ability.

The data available allowing a similar investigation to that of Borjas's were drawn from the (Australian National University) 1973 Social Sciences Survey of Australian male residents aged 30–64, which includes a sample of about eighteen hundred wage- or salary-earning individuals, and the 1/100 Census tapes from 1981. The results of the analysis are reported in Beggs and Chapman (1988). They imply that the likelihood of cross-sectional data being

markedly contaminated by significant changes over time in unobserved variables is small.

The other major possibility rendering cross-sectional analysis questionable concerns the effects of remigration on the average unobserved ability of remaining cohorts. In Australia, this issue is potentially important, particularly if the question concerns the differential relative labor market outcomes of immigrants from English-speaking countries (ESM) and immigrants from non-English-speaking countries (NESM), because marked differences exist in the probability of remigration, as shown in table 14.1.

These data, while not ideal as reflections of remigration probabilities over the period 1959–82 (since some of the arrivals may still depart and some of the departures may yet return), are useful as broad indications of the empirical dimensions of the process. They suggest that about 20–30 percent of ESMs are likely to leave but that only 3–6 percent of NESMs do likewise. Two salient points are (1) that the proportion of the former group leaving is high, implying that, if a relationship exists between unobserved ability and remigration, the use of cross-sectional data for this group is suspect and (2) that the problem is much less likely to be the case for NESMs.

The biases introduced by remigration could go either way, but they are usually believed to have the following pattern: the least successful immigrants eventually return home or seek economic success elsewhere. Thus, the average ability of identified immigrants could be expected to increase with period of residency, and the coefficient on this variable is thus biased upward in absolute size in both wage and unemployment estimations. Alternatively, successful immigrants are more capable of moving because they have accumulated sufficient wealth. It follows that an unambiguous prediction of the direction of bias is not forthcoming.

Immigrants' decision to remain in or leave new countries cannot be analyzed only on the basis of economic performance in the host country since what will be of importance is expected income in alternative countries. Even if success has been relatively low in the new country, this does not necessarily imply an increased incentive to return.

This complexity might render questionable one of Chiswick's (1986) tests of the return migration proposition. He argues that, if immigrants from coun-

Table 14.1   **Arrivals and Departures of Male Immigrants, 1959–82**

Country of Birth	Arrivals	Departures	Departures/Arrivals
United Kingdom and Ireland	1,086,054	231,810	.213
New Zealand	118,157	33,878	.287
Italy	18,736	10,660	.0569
Greece	159,763	5,374	.0336

Source: Obtained from the Department of Immigration and Ethnic Affairs.

tries with relatively high period of residency coefficients are also those immigrants who from other evidence are less likely to return, the self-selection process is empirically unimportant. The indications are that this is the case (Cubans, e.g., have very high rates of return to residency but few returnees), but the noted theoretical ambiguity casts doubt on the result.

One empirical way to get at the return migration issue is to examine the residuals of the wage equation. They should exhibit skewness related to job tenure, the direction of which will be determined by whether or not high- or low-ability persons eventually leave. Negative skewness implies that the top part of the intangible ability distribution (the residual) shortens with tenure, that is, that the more able increasingly have left the sample. The opposite is the case if lower-ability persons are more likely to leave as tenure increases.

Given the aggregate data, systematic biases from attrition imply the following. If lower-ability immigrants are generally more likely to return, skewness of the residuals with period of residency (PER) should be positive for both ESMs and NESMs and greater for the former group. On the other hand, if higher-ability immigrants are generally more likely to return, skewness of the residuals with PER should be negative for both ESMs and NESMs and absolutely greater for the former group. The finding that skewness does not exist implies that the attrition process is unrelated to unmeasured ability, at least as reflected by the residual of the wage equation.

The test took the form of estimating the following equation:

$$(1) \qquad RES3 = a + b\text{PER} + c\text{PER}^2 + d\text{YOS} + e_R,$$

where RES3 is the cube of the OLS residuals obtained from the 1981 cross-sectional estimations reported in Beggs and Chapman (1986), and YOS is years of schooling, included as a control. The results are presented in table 14.2.

The results imply that there is no evidence from the wage data of the 1981 Census of an important relationship between unmeasured ability and the likelihood of remigration of either ESMs or NESMs. The nature of the tests suggests that this cannot be taken as strong confirmation of the lack of correlation between ability and remigration. The appropriate conclusion is that the test

Table 14.2   Skewness Tests of the Return Migration Hypothesis

ESM: .120 − .00311PER + .0000143PER² − .00554YOS
       (.50)   (.25)   (.048)   (.34)

NESM: .206 − .0106PER + .000PER² − .00345YOS
       (1.08)   (.74)   (.27)   (.31)

Note: Absolute *t*-statistics in parentheses.

has not uncovered any information in Australia with respect to remigration that places in question the validity of the usual estimations based on cross-sectional data.

In summary, the data and tests on wage relationships outlined above reveal that, for Australia, there is no evidence that major differences in the unobserved ability of immigrant cohorts significantly undermine the value of wage and unemployment analyses based on cross-sectional data, a point more obviously true for ESMs than NESMs. If immigrants entering in particular years are of considerably different quality than others, or if persons remigrating come from either end of the ability distribution, we have not been able to uncover powerful evidence for these effects. Given this as background, we now proceed to an examination of immigrant wage and unemployment outcomes as documented in the 1981 Australian Census under the assumption that tests based on such a cross section are at least moderately sound.

14.2 Immigrant Relative Wage Experience in Australia

The first multiple regression analysis of immigrant earnings in Australia was conducted by Haig (1980), who used data collected by the Australian Bureau of Statistics for the Henderson Inquiry into Poverty in Australia 1973. The study attempted to determine the role of endowments and discrimination in explaining immigrants' relative earnings, with a conventional application of the methodology popularized by Oaxaca (1973) and Blinder (1973). Control variables used were, among others, age, hours, education, sex, and country of origin. Because Haig restricted slope coefficients to be identical for men and women, assumed hours worked to be exogenous, and used age as an experience proxy, the results should be treated with caution. Nevertheless, for the purposes of the present investigation, it is of interest to note his finding that immigrants generally, and immigrants from southern Europe in particular, had relatively flat age-earnings profiles in 1973. Period of residency was apparently an insignificant earnings determinant.

More disaggregated approaches have been adopted by Stromback (1984), Chiswick and Miller (1985), and Beggs and Chapman (1986) using the 1 percent household sample of the 1981 Australian Census. The analyses used similar specifications and, thus not surprisingly, drew similar conclusions—that ESMs experienced wage structures similar to the Australian born but that other immigrants received relatively low returns to schooling and experience. The data reveal no catch-up for NESMs.

These results can be interpreted only imperfectly in the context of the transferability of investment in human capital: while they imply that skills acquired in like countries are rewarded more highly than skills acquired in dissimilar countries (non-English-speaking countries), they also suggest that those immigrants starting with a wage disadvantage relative to the native born remain with a wage disadvantage over their Australian working lives. This finding is

at variance with some U.S. and Canadian conclusions derived from cross-sectional analyses.

While it is important to acknowledge that cross-sectional analyses implicitly impose the assumption that unobserved ability is uncorrelated with immigrant length of residency, the estimations presented in section 14.1 above suggest that, for Australia, this point is not of great empirical significance. What is, perhaps, of much more importance in an understanding of immigrant wage adjustment processes is the role of education. In particular, previous research has imposed the restriction that relative wage returns and rewards to labor market experience do not vary with education. The major contribution here is to relax these assumptions, an approach revealing quite different insights into immigrant wage outcomes to those reported above.

As well as allowing relative wages and experience effects to vary with schooling, an innovation of our approach is the use of nonparametric techniques to estimate the wage functions. The choice of the kernel smoothing (nonparametric) technique was motivated by the following issue. The approach obviates the need to prespecify the precise analytic functional relation between the explanatory variables and the wage rate, and it is this major benefit that we have taken advantage of. Also, the technique is ideally suited to large samples because of its convergence properties (Bierens 1985) and is ill suited to small data sets.

The nonparametric approach is not without costs. Specifically, the method lacks the familiar summary of a model as a small number of estimated parameters, and there is no easy access to the usual test statistics, although pointwise confidence intervals may be computed. Also, it is not quite appropriate to estimate the expected wage rate given values of more than just a few of the regressor variables of interest. In short, the approach trades off flexibility and complexity, and in its adoption we have chosen more of the former.

The basic model is that hourly income depends on individuals' measured human capital characteristics. In the analysis reported below, we allow for the effect on income of years of schooling (YOS), potential years in the labor market (LMX), years of Australian schooling (AYOS), and years of potential labor market experience before migrating to Australia (ALMX). As well, there is a separation of the sample according to country of origin. Three male groups are distinguished: Australian born (AUST), ESM, and NESM.

The wage equations are

(2) $W_{AUST} = f_{AUST} (YOS, LMX)$,

(3) $W_{ESM} = f_{ESM} (YOS, LMX, AYOS, ALMX)$,

(4) $W_{NESM} = f_{NESM} (YOS, LMX, AYOS, ALMX)$,

and the statistical characteristics of the data are reported in Appendix table 14A.1. The results of the nonparametric regressions are presented in graphic form, the interpretation of which is straightforward. The computed confidence

intervals are not shown for reasons of clarity, their size being such as not to affect conclusions.

We consider four education levels, 8, 10, 12, and 14 years of completed schooling, with the results showing the cross-sectional relationship between wage and age (LMX + YOS + 5) for natives, ESMs, and NESMs. The immigrants are hypothetically given AYOS = 0 and ALMX = LMX. That is, the relationships for these groups should be interpreted as representations of the experience of male individuals entering Australia immediately after completing their schooling abroad. They are shown in figures 14.1.

The data of figure 14.1a reveal the following. First, natives with very low schooling earn, overall, lower hourly incomes than all immigrants, although there is no obvious difference between natives and NESMs until about age 36, after which NESMs have higher incomes. Second, ESMs experience higher incomes at all ages than the other two groups, with the difference being maximized for those in their mid-forties. Third, and related to the above, at relatively young ages the age-earnings profiles are steeper for immigrants than natives and steeper for ESMs than NESMs.

For males with 10 years of schooling (fig. 14.1b), the following points are pertinent. (1) Unlike the situation for the lowest level of schooling, natives earn higher incomes than NESMs at all ages. (2) Similar to the results for the lowest level of schooling, ESMs earn higher incomes than natives at all ages, with the difference being the greatest for persons in their late forties.

From figure 14.1c, it is apparent that, for those with 12 years of schooling, native incomes are higher than those of NESMs and that this advantage is greater than is the case of persons with 10 years of formal education. Also, apart from those younger than 30 years—where income per hour is about the same—natives earn more than ESMs. As is the case with other schooling levels, ESMs earn higher incomes than NESMs, and the profile of the former is relatively steep, at least until about age 50.

Figure 14.1d reveals that, at high levels of schooling (14 years), natives earn substantially higher incomes than immigrants. It is important to note that the relative income advantage of the former group is apparently greater than was the case for those with 12 years of schooling. As is the case with the groups having 10 and 12 years of schooling, NESMs earn less than ESMs and natives at all ages and have flatter profiles.

The figures, considered sequentially, reveal a striking pattern: as education increases, so too does the relative income advantage of natives. At lower levels of schooling, immigrants earn the same as, or more than, natives, but, at the highest levels of schooling, this situation is reversed. Also, NESMs earn lower incomes than ESMs for all levels of schooling and generally have flatter age-earnings profiles. These findings highlight the importance of disaggregated analysis of immigrant relative wage outcomes, in particular as regards education.

Most important for the analysis, the nonparametric approach reveals the
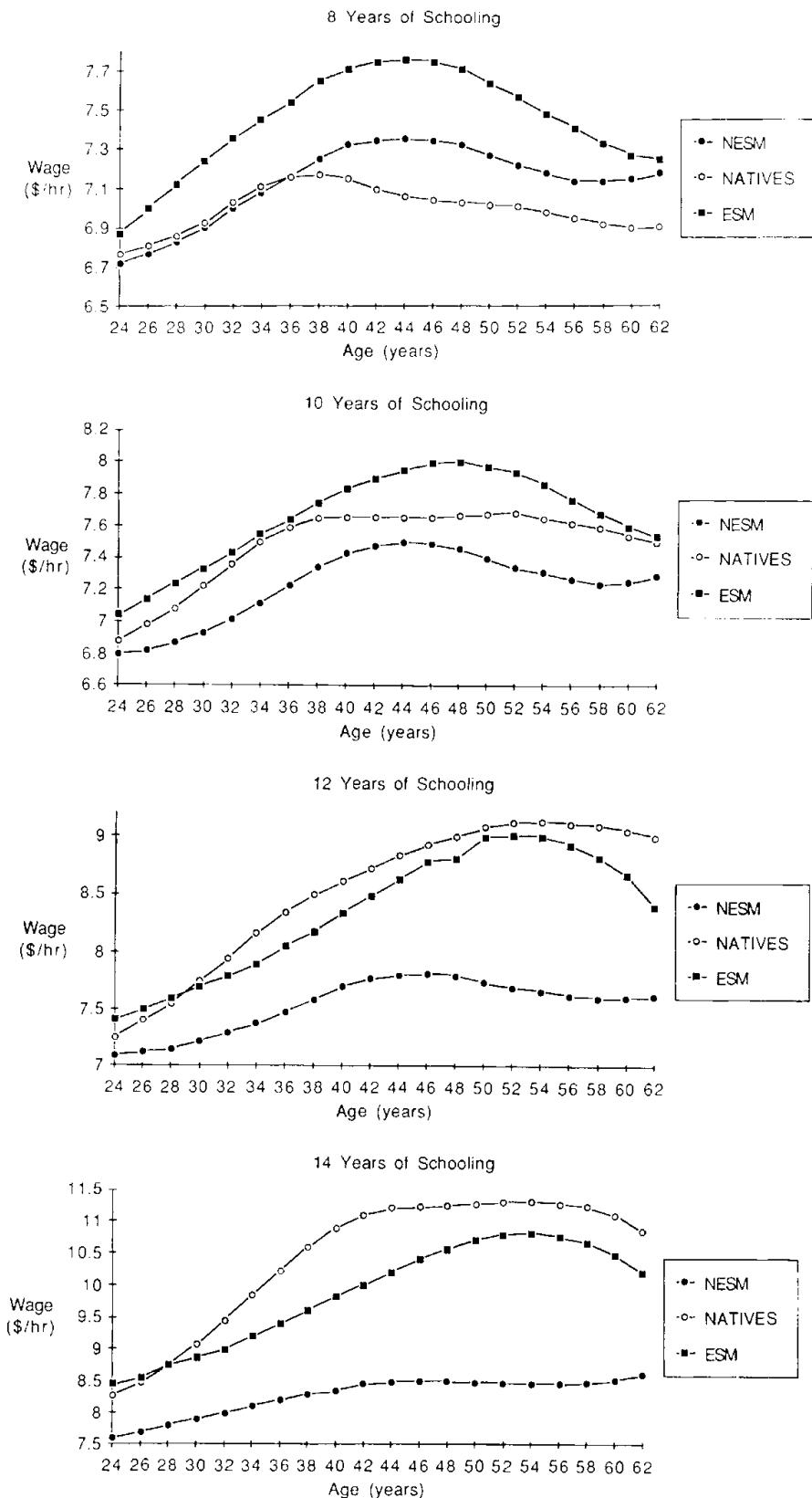
Fig. 14.1   Nonparametric regression estimates of average hourly wage rate

importance of flexible estimation, two salient points being clear. (1) It is obviously not the case that returns to Australian labor market experience are identical for different schooling levels, the assumption usually imposed in OLS wage estimations. (2) Most important, interpretation of which immigrant groups are apparently relatively disadvantaged in wage outcomes is inadequate without considering the effect of schooling. Interestingly, the essence of this story is replicated with respect to unemployment, an investigation to which we now turn.

14.3   Immigrant Relative Unemployment Experience in Australia

Analyses of the relative unemployment experience of immigrants in Australia (Miller 1986; Inglis and Stromback 1986) have, as with wage determination research, imposed parsimonious functional forms. In particular, the approaches have not allowed the effect of unemployment determinants to vary between groups, a method that restricts the effects of schooling to be the same irrespective of ethnicity. In the analysis reported below, we allow the effects of schooling (and other variables typically associated with unemployment) to vary between AUST, ESM, and NESM. Although the estimations constrain Australian labor market experience to have the same effect on unemployment for different schooling levels, they nevertheless offer compelling evidence on the effect on relative immigrant labor market outcomes of education entirely consistent with the wage analysis reported above.

Search theory is used to motivate the empirical approach adopted, and we have described the advantages and problems of this framework elsewhere (Beggs and Chapman 1990). The model allows only one prediction unambiguously (in essence because the distribution of the wage offer curve will not be the same between groups). This is that the relative unemployment rate is lower for unskilled immigrants than unskilled natives. The prediction follows from our critique of the theory but is not crucial to understanding the results following.

The simple reduced form derived from search theory is

$$(5) \quad P(u)_i = \delta_0 + \delta_1 LMX_i + \delta_2 LMS_i^2 + \delta_3 YOS_i + \delta_4 YOS_i \\ + \delta_5 ALMX_i + \delta_6 ALMX_i^2 + \delta_7 MAR_i + \delta_8 LANGD_i + \varepsilon^\delta,$$

where $P(u)_i$ equals one if the individual is unemployed and zero if employed, and the explanatory variables are potential labor market experience (LMX); potential Australian labor market experience (ALMX); a dummy variable equal to one if currently married, spouse present, and zero otherwise (MAR); and a language dummy variable equal to one if the respondent has English-language problems and zero otherwise (LANGD).

The probit estimations were run separately for natives, ESMs, and NESMs, a procedure allowing important insights into the role played by education. Statistical characteristics of the data, random samples from the 1 percent of

males in the 1981 Census, are shown in Appendix table 14B.1, and the results are reported in table 14.3.

From table 14.3, the strongest single effects on unemployment are from schooling and marital status. The potential labor market experience variables exhibit low individual t-statistics. This reflects the fact that LMX, LMX^2, and $ALMX^2$ are highly correlated in the sample, implying that it is difficult to distinguish their individual contribution to unemployment. Consistent with this interpretation, the log-likelihood ratio statistics indicate that only the joint test of the null hypothesis $\beta_{LMX} = \beta_{LMX}^2 = 0$ for NESM fails to be rejected by the data.

The highly nonlinear form of the probit probability model hampers straightforward comparison of immigrant and native coefficients. Interpretation of the main relationships is facilitated through consideration of figure 14.2. To allow comparisons with the results reported in section 14.2, each section of the figures corresponds to a different level of total schooling, with the levels chosen being 8, 10, 12, and 14 years. AYOS and LANGD are set equal to zero, and MAR is set equal to one. Three categories of workers are considered:

AUST = Australian born;

ESM = immigrants from English-speaking countries with no labor market experience before entering Australia;

NESM = immigrants from non-English-speaking countries with no labor market experience before entering Australia.

Table 14.3   Probit Estimates of Probability of Unemployment

Variable	Australian Born	ESM	NESM
Intercept	.359	.397	− .630
	(.95)	(1.23)	(2.2)
LMX	− .0213	− .0533	.00137
	(1.15)	(2.96)	(.075)
LMX^2	.000254	.00104	.0000770
	(.76)	(3.30)	(.25)
YOS	− .129	− .0773	− .0335
	(5.81)	(4.20)	(2.72)
AYOS		− .000104	− .0134
		(.00932)	(1.16)
ALMX		− .0252	− .0250
		(1.92)	(1.71)
$ALMX^2$		.000299	.000240
		(.96)	(.61)
MAR	− .568	− .559	− .468
	(6.38)	(6.67)	(5.18)
LANGD			.123
			(1.62)

Note: Absolute t-statistics in parentheses.

The figures reveal some important similarities. First, ESMs have lower probabilities of unemployment than do NESMs, for all levels of schooling and preimmigration work experience. From theory, this implies that the greater search costs of the latter group are outweighed by other job search factors related to ethnicity. Second, as period of residence increases, the gap between immigrant and native unemployment changes only very slowly. In general, over the range of normal life-cycle labor market experience, there is no crossover.

Most important for the theme of this paper, it is clear that, as the level of schooling increases, so too does the relative immigrant unemployment rate. From figure 14.2a, immigrants with low levels of schooling (8 years) have lower probabilities of unemployment than natives over the life-cycle range of labor market experience. On the other hand, at the highest level of schooling considered (fig. 14.2d), immigrants have higher probabilities of unemployment than like natives over the life-cycle range of labor market experience. Clearly, and interestingly, the result is the same as that revealed for wages: as education increases, the labor market position of immigrants relative to natives systematically deteriorates.

The important upshot of these results is that it is not possible to understand influences on relative unemployment status without distinguishing the differential effects of schooling. As with the wage analysis, existing research has missed an important point by the restriction of education effects. We offer some tentative conjectures on the results below.

14.4 Interpretation

Through a disaggregated analysis of immigrant relative wages and unemployment, a distinct phenomenon has been revealed. For these labor market outcomes, it is apparent that, relative to like natives, immigrants with low levels of education fare well. However, as years of schooling increase, immigrants' relative labor market success decreases. At the highest level of education considered, immigrants both earn less and have a higher probability of unemployment than is the case for natives. For both Australian and other research, it is important to note that our estimation techniques have highlighted the potential for misinterpretation inherent in existing approaches.

The interesting and difficult challenge is to explain satisfactorily the consistent relationships uncovered between relative educational status and immigrant labor market outcomes. Tentatively, we offer four possibilities, perhaps in order of importance.

First, and most obvious, is the issue of accreditation of educational qualifications. This could result from two possibilities. (1) Australian employers, if risk averse and with less than full information about the value of overseas schooling, systematically devalue immigrant formal training. (2) Local

10 YEARS SCHOOLING

8 YEARS SCHOOLING

Probability of unemployment

8

7

6

5

4

3

2

1

0

NESM

AUST

ESM

Labor market experience

5 10 15 20 25 30 35 40 45 50

AUST

NESM
ESM

Labor market experience
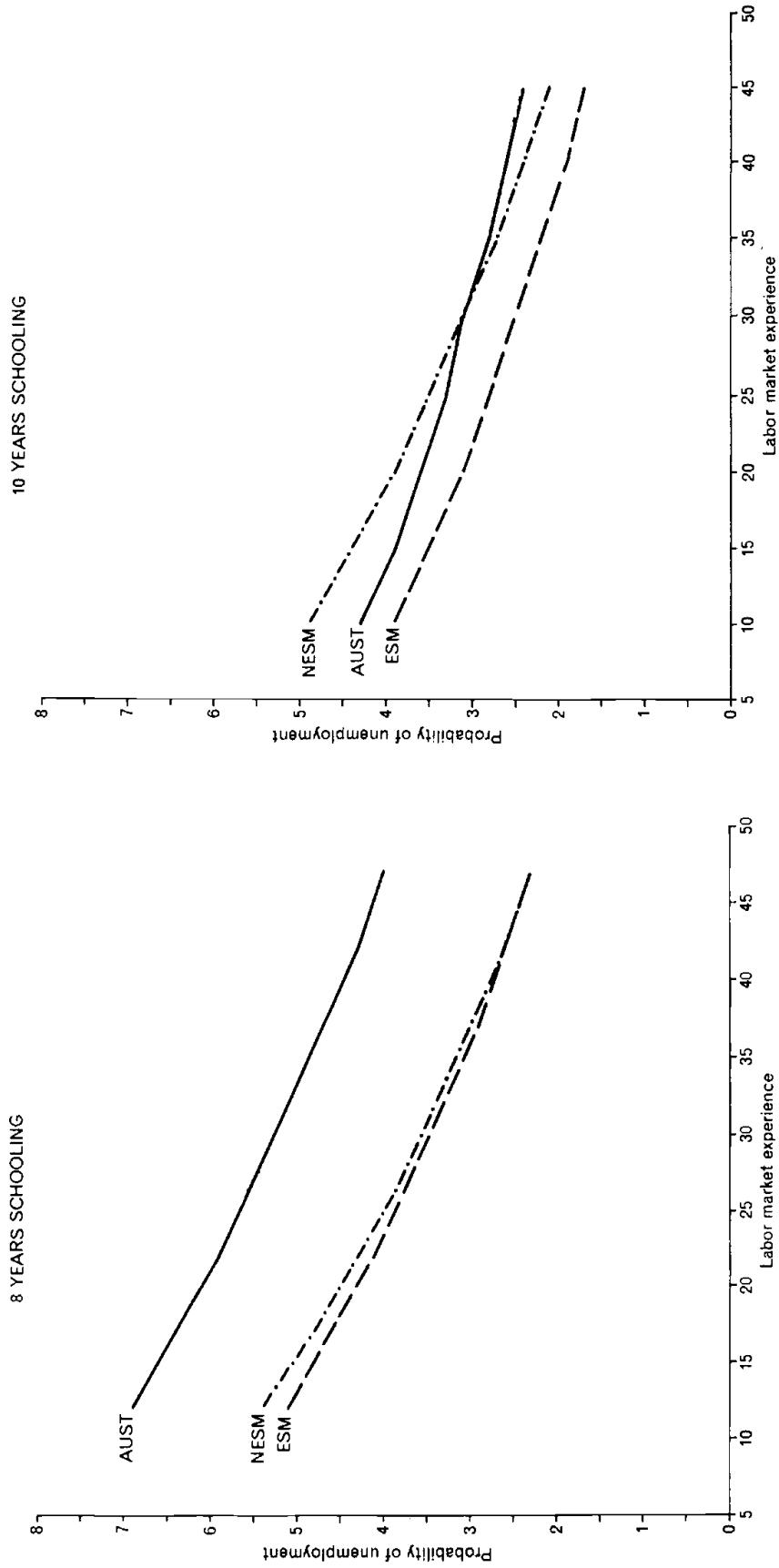
**Fig. 14.2 (*a, b*)   Unemployment and labor market experience**
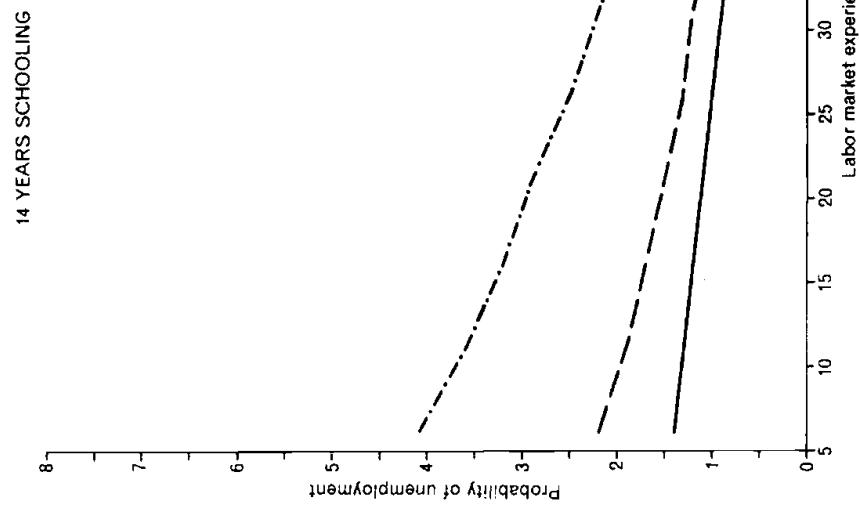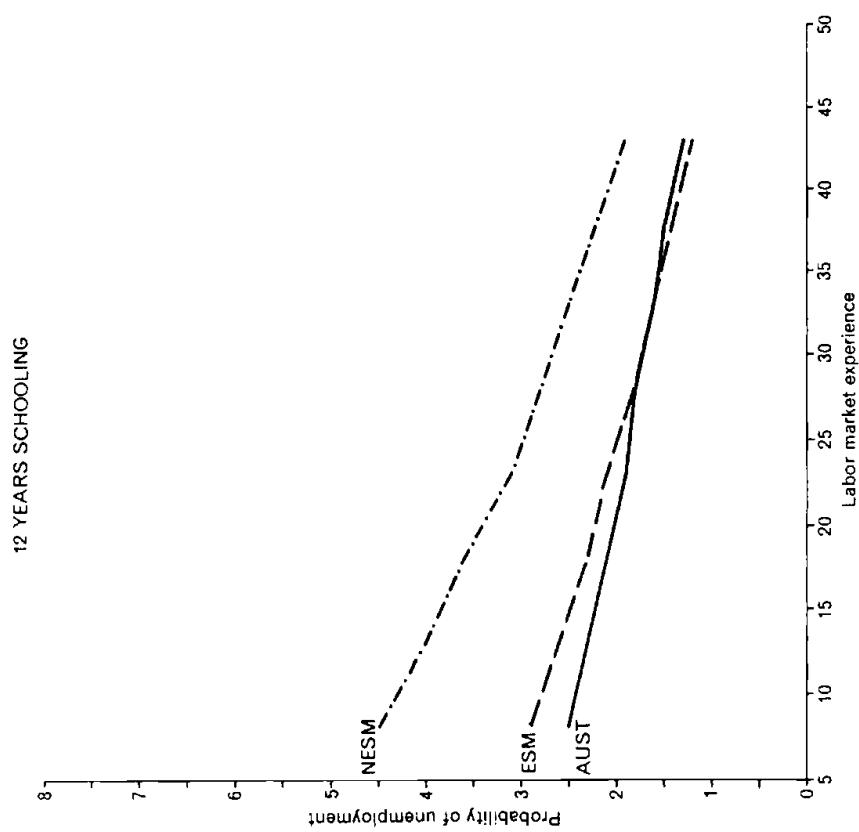
Fig. 14.2 (c, d) Unemployment and labor market experience

employers, trade unions, or professional agencies act in such a way as to protect domestic special interest groups. There is considerable anecdotal (Iredale 1988) and other (Chapman and Iredale 1990) evidence for this perspective.

Second, a lower valuation of overseas schooling at high levels of schooling may result because education is less transferable internationally at higher levels. In other words, education is positively correlated with the acquisition of country-specific skills. To take an extreme example, consider the transferability of accountancy qualifications relative to the transferability of street-sweeping skills. In the former case, a high level of country-specific knowledge, such as the understanding of tax and company law, is presumably required. For the latter, sweeping a street in Rome is probably very similar to sweeping a street in Melbourne, and such work would require very little understanding of Australian institutions or the legal system.

A third possibility is that of an unobserved variable, motivation or ability, and its relation to immigrant selection procedures. If low-education immigrants are more likely to be selected by immigration authorities if they are particularly work oriented, it follows that relative to the native born their Australian labor market outcomes would be favorable. In this view, immigration authorities are trading off work orientation or talent for formal qualifications in selection of applicants. This possibility implies a shortcoming of the estimation techniques in that the model may be misspecified because of omitted variables and their correlation with education.

A similar econometric issue motivates the last explanation of results. This is that the quality of schooling is actually higher in Australia than overseas, or at least is perceived to be so by local employers, a point obviously related to the first possibility offered. Thus, as schooling increases and the quality issue becomes more important, more highly educated immigrants will have their overseas credentials increasingly unrewarded.

As noted, we do not have strong priors as to which possible explanation of results is most compelling, the goal having been to demonstrate the importance of more flexible estimation of immigrant relative labor market outcomes than has so far characterized the literature. The very important finding, unrecognized in other research, is that immigrant labor market outcomes (at least in Australia) become more adverse—relative to like natives—as schooling increases. One challenge highlighted is the explanation of the consistency of results found for the role of education. Another is to determine whether the systematic relationships discovered also exist for other countries. If they do, that surely implies the usefulness of a reorientation of research generally.

Appendix A

Table 14A.1   **Statistical Characteristics of the Data for Wage Estimation**

Variable	AUST	ESM	NESM
Years of schooling	22.78	12.12	11.13
	(2.45)	(2.47)	(3.30)
Years of labor market experience	25.61	25.91	27.36
	(12.19)	(11.93)	(11.68)
Years of Australian labor market experience		15.67	17.80
		(10.28)	(9.52)
Years of Australian schooling		1.73	1.82
		(4.07)	(4.06)
Weekly income (dollars)	301.90	314.39	262.95
Number of observation	10,532	2,917	3,083

Note: Means with standard deviations in parentheses.

Appendix B

Table 14B.1   **Statistical Characteristics of the Data for Unemployment Estimation**

Variable	Australian Born	English-Speaking-Country Born	Non-English-Speaking-Country Born
YOS (years)	11.65	12.12	11.15
	(2.42)	(2.46)	(3.33)
LMX (years)	25.54	25.87	27.33
	(12.22)	(11.94)	(11.63)
MAR	.78	.79	.84
ALMX (years)		15.68	17.80
		(10.28)	(9.53)
AYOS (years)		1.72	1.78
		(4.06)	(4.17)
LANGD			.44
Aggregate unemployment rate (%)	3.44	4.36	4.60
Number of observations	3,634	3,668	3,607

Note: Means, standard deviations in parentheses.

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