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Vocational education, migration, and labour market outcomes: a comparison of short-term returns for migrants to Australia

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Abstract [incomplete]

This paper analyses the short-term returns to vocational education for immigrants to Australia using three measures of labour market outcomes: the hourly wage, entrepreneurship, and over-education. In addition, it estimates the effect of certifying the foreign qualification as arranged by Australia's department of immigration. Using data from the Longitudinal Survey of Immigrants to Australia (LSIA), and controlling for endogeneity in the decision to certify the qualification obtained abroad, the preliminary results provide evidence of relevant differences in educational returns amongst immigrants, and broadly support their improvement when foreign qualifications are assessed by DIAC. They also confirm that the effective transfer of foreign skills to Australia depends on where it was acquired.

JEL classification: C34, J24, J61

Keywords: immigration, education, economic assimilation

1. Introduction

The topic of vocational education, seen as a period of training in specific as opposed to the generic knowledge and skills at the core of higher education, is receiving increasing attention as an effective educational choice leading to positive labour market outcomes in both developing and developed countries. In developing countries, where jobs in the ‘formal’ economy are rationed and self-employment accounts for over 50% of those participating to the labour market, vocational education is seen as a tool to both reduce the incidence of the informal economy and to create jobs via enhanced entrepreneurship. In developed countries, vocational education is seen as a channel to improve the employment prospects of young people facing substantially higher and prolonged unemployment prospects since the Global Financial Crisis of 2008 and the slow job growth that ensued (e.g. Eichhorst et al, 2012).

The provision of vocational education varies considerably across countries, affecting the international comparability of graduate outcomes (e.g. Eichhorst, Rodriguez-Planas, Schmidl, and Zimmermann, 2013). Estimates of the returns to vocational education nevertheless suggest, once self-selection into this type of education is controlled for¹, that it offers similar or better returns than general education (e.g. Moenjack and Worswick, 2003; Neuman and Ziderman, 1999), supporting governments’ institutional provision and financial support.

Although existing studies tend to be country-specific, they typically do not investigate the returns to vocational training acquired by immigrants before migration. Yet, exploiting cross-immigrant variations in educational returns to understand the international transferability of specific skills acquired abroad is relevant to uncover possible mediating effects from institutional settings in the countries of origin (e.g. education systems), which may be

¹ Not doing so leads to an omitted variable bias. In comparisons between vocational and university students, this will lead to under-estimates of the returns to vocational education if vocational education students have a lower ability and motivation than those attending university. Similarly, the bias will generate over-estimates of the return to vocational education if vocational students have higher motivation and abilities than school dropouts.

relevant to better contextualise the ‘loss’ of individuals trained at the expense of the local tax payer. The variation in returns to education from immigrants’ formal schooling is also relevant to assess the overall ‘consistency’ between the workings of various institutions that contribute, in the host country, to make possible such transfers of skills (e.g. immigration policies and local labour market settings). This is especially so for countries operating selective immigration policies, whose efficiency in providing relevant skills to domestic employers is regularly reviewed. As a result, understanding whether host country employers differentiate between the type of skill (vocational versus tertiary education) and where the migrant acquires such skill helps addressing critical policy questions about education, immigration, and labour market. Examples of such questions are:

- (i) whether foreign vocational education from countries that are culturally and linguistically similar to the place of destination enjoys a premium relative to that gained in other places of origin (e.g. Chiswick and Miller, 2009), implying that for at least some immigrants it is preferable to complete their education in the host rather than their home country (e.g. Chan, Heaton, and Tani, 2013);
- (ii) whether the premium/discount, if any, to foreign education disappears once the degrees earned abroad are officially certified by the authorities of the place of destination when this institutional instrument is available, implying that a foreign qualification requires a further ‘signal’ from credible sources in the destination country in order to receive appropriate rewards; and
- (iii) whether awarding points to foreign education without differentiating the country from which such education is acquired places immigration policy at odds with the working of the local labour market by contributing to higher rates of over-education within the immigrant population (e.g. Green et al, 2007).

This paper addresses those questions using data from the Longitudinal Survey of Immigrants to Australia (LSIA), which covers a representative sample of immigrants entering Australia during 1993-1995 and 1999-2000. Australia has a large immigrant population (about 25%), applies a selective immigration policy exclusively focused on immigrants' immediate employability, and awards points to foreign education regardless of where it is acquired. Furthermore, Australia offers the possibility to have foreign qualifications certified. Such service is administered by Overseas Qualifications Units within the Department of Immigration and Citizenship (DIAC). The OQU's objective is "to assist migrants to obtain recognition of their overseas gained skills and qualifications" especially with respect to "statements of educational comparison for qualifications obtained overseas; and information on where and how to obtain specific occupational assessments and which occupations have licensing and regulatory requirements². This certification can be valuable as it adds a domestic signal to an immigrant's evidence of possessing certain skills, albeit acquired abroad.

The empirical analysis focuses on the short-term returns (within 12 months from settlement) to immigrants' vocational education using three measures of labour market outcome: the hourly wage, entrepreneurship, and over-education.

The [preliminary] results provide evidence of relevant differences in educational returns amongst immigrants, and broadly support their improvement when foreign qualifications are assessed by DIAC. They also confirm that the effective transfer of foreign skills to Australia depends on where it was acquired. This is recognized by Australian employers through the wage paid and the effective usage of immigrants' skills, and the recognition of DIAC's certification. These results highlight the possible benefit to target potential immigrants from

²” (<http://www.immi.gov.au/asri/os-qual-units.htm> - accessed 14 January 2014)

certain geographical regions to study in Australia prior to migration, and to encourage the use of the certification of foreign education as part of the settlement documentation.

The rest of the paper is organised as follows. Section 2 provides a brief literature background. Section 3 presents the data. Section 4 discusses the results. Section 5 concludes.

2. Literature Review

Vocational education loosely includes qualifications obtained at (upper) secondary schooling level. Two recent surveys highlight the substantial heterogeneity in the provision of such education around the world. Eichhorst et al (2012) propose a 5-system classification based along two dimensions: the first is a theory-vs.-practice divide, whereby formal vocational education contains no or mostly work-based training. The second is a government-vs.-industry divide, whereby vocational education is provided either institutionally (formal education system) or through vocational training centres tied to industry. The five systems are (i) vocational/technical secondary schools, where the curriculum is set by formal educational institutions, as occurring in Southern Europe, Russia, and parts of Africa; (ii) vocational training centres, which combine formal education with subsequent internships, as in Latin America; (iii) formal apprenticeship, where institutionally-provided education is complemented by training in the workplace, as in English-speaking countries; (iv) a dual system, where firms and government concur in providing a highly structured specialist education and relevant work experience, as in Central Europe; and (v) informal vocational training, where education is non-institutional but semi-structured, as in many developing countries in Asia and Africa.

Empirical research on the effectiveness of vocational education in achieving desirable labour market outcomes surveyed in Eichhorst et al (2013) points out that the returns to vocational education are typically as beneficial as those provided by general education across the five

systems highlighted above. For example, a study on Thai cross-sectional data finds similar returns to upper-secondary levels vocational and general education, and higher returns than those obtained through tertiary education (Moenjack and Worswick, 2003). Positive effects from vocational education are also found for vocational training centres (e.g. Betcherman et al, 2007), apprenticeship (e.g. Bonnal et al, 2002), the dual system (e.g. Parey, 2009), and informal training (e.g. Aggarwal, Hoffmann, and Phiri, 2010).

The focus of the economic literature on the returns to vocational education in the context of migration is scarce, and appears largely confined to questions surrounding the intergenerational transmission of educational choices between first- and second-generation immigrants³. A key result of this literature is the finding of statistically significant country of origin effects, implying a strong association between someone's ethnicity and subsequent schooling. This effect is also found by the more developed literature on the international transferability of human capital. This body of work does not distinguish between vocational and other educational choices. Its main finding is that pre-migration education is penalised by host country employers and that investing in further education in the host country is often essential to revert such penalty and 'reappropriate' some of the benefits associated with pre-migration schooling that were lost as a result of migration (e.g. Chiswick, 1978; Friedberg, 1997; Jonkers, 2008; Basilio and Bauer, 2010). A key example of educational investment in the host country is the learning of its language (e.g. Dustmann, 1997; Chiswick and Miller, 2009 and 2010). Analyses applied to the US (e.g. Bratsberg and Ragan, 2002) and Australia (e.g. Chiswick, Lee and Miller, 2005; Parasnis, Fuasten and Cheo, 2008) largely support these conclusions even when countries of origin are not grouped by average income level (as

³ Here it is found that the educational attainment of immigrants' children reflects only to a limited extent that of their parents (e.g. van Ours, 2003), if at all (e.g. Gang and Zimmermann, 2000), though there are clear country-of-origin effects (e.g. Riphahn, 2003).

in Bratsberg and Ragan, 2002), but by cultural and linguistic distance (as in Chiswick and Miller, 2005). In the case of Australia, immigrants even seem to experience what Chiswick and Miller (2012) call ‘negative assimilation’: initially high earnings are followed by negative earnings growth. This result is viewed as driven by (generally) English-speaking high-income migrants receiving an initial high wage offer to compensate for the fixed costs of moving. As time progresses employers remunerate only the human capital component of the immigrant, not the one-off cost of moving, with consequent lower subsequent earnings.

This paper is closest to two relatively recent studies that discuss the returns to pre-migration vocational education, albeit in the context of wider educational choices. Neuman and Zimmerman (2003) estimate these returns for immigrants to Israel in the decade prior to 1982 (their analysis is based on the Census of Population of 1983). They find that pre-migration vocational education has no statistically detectable effect on hourly wages compared with attending other types of education, even when immigrants hold jobs matching their skills. This result contrasts sharply with the one obtained for natives (‘veterans’), who instead enjoy a wage premium (about 8%) if working in a job matching their educational attainment. This is interpreted as further evidence of imperfectly transferable skills across national labour markets, even when these skills are specific, as in the case of vocational education.

Chan, Heaton and Tani (2013) analyse the returns to vocational, undergraduate and post-graduate education acquired in ten groups of countries of origin differing in level of economic development and use of the English language for recent immigrants to Australia. In the case of technical diplomas and certificates, they find significant statistical evidence of hourly wage premiums for those qualifying in mostly developed English-speaking economies (the UK and Ireland, the US and Canada, and South Africa) relative to comparable immigrants completing vocational education in South Asia (the reference group). They interpret these results as evidence of the imperfect transferability of human capital across

countries, particularly for those with non-English speaking background, and as a cause for possible income inequality amongst immigrants in Australia. Their analysis however is restricted to males, and does not explore the possible effect of the official certification of qualifications acquired abroad. This paper extends their work with a focus on these gaps. In addition, the paper discusses the returns to immigrants' vocational education in the context of several measures of labour market outcomes, which are relevant to productivity, foreign skills' utilisation, and, ultimately, the economic success of the immigration process.

3. Data

The data used in the analysis is sourced from the Longitudinal Surveys of Immigrants to Australia (LSIA), a panel survey of three cohorts of immigrants to Australia: LSIA 1 covers migrants who arrived in Australia between September 1993 and August 1995. It contains three waves, with interviews conducted at 5, 17 and 41 months after arrival; LSIA 2 consists of two waves with interviews conducted at 5 and 17 months after arrival of immigrants who arrived between September 1999 and August 2000; LSIA 3 has only one wave and samples immigrants who arrived in Australia (or were granted their visa onshore) between December 2004 and March 2005. There is a substantially smaller number of questions in LSIA 3 relative to LSIA 1 and 2, making it unfeasible to carry out the analysis over the three cohorts. The LSIA was commissioned in the early 1990s to fulfil DIAC's need for better information on the settlement of new migrants than what covered in censuses. It is based on a representative sample of 5 percent of migrants/refugees and contains more than 300 questions about settlement and conditions experienced pre-emigration in the home country and after relocating to Australia. The LSIA is carried out separately on primary applicants and

migrating-unit spouses.⁴ Overall, there are 5,192 primary applicants and 1,838 spouses in LSIA (Cohort) 1, while 3,124 primary applicants and 1,094 spouses were interviewed as part of LSIA (Cohort) 2 (Cobb-Clark XXX??).

The LSIA was explicitly design to exclude potential immigrants applying onshore, such as international students in Australia. However, it includes about 350 observations about individuals completing their highest education in the country prior to returning home and, presumably, re-applying for permanent settlement. These observations are omitted from the sample used in the analysis. The sample is restricted to the first wave of both cohorts to focus on the short-term labour market effects of pre-migration education, to primary applicants aged 20-65, and to individuals who completed more than 12 years of schooling abroad. The resulting sample size contains 4,987 successful primary visa applicants.

A dummy variable capturing the education-occupation mismatch in Australia is created, based on Piracha, Tani, and Vedean (2012) whereby, for each job category, the level of education is compared with that required to perform it. Such tabulation is defined by DIAC, and identifies managers, administrators and professionals as requiring “bachelor or higher” education. Associate professionals, tradespersons, clerks, salespersons and personal service workers, and plant and machine operators and drivers are required to have at least a “diploma or vocational degree”. Labourers and related workers require “secondary or less” education. ‘Over-educated’ are respondents with a level of education above what required according to DIAC’s schedule, such as individuals with a vocational education certificate but are employed in a job that requires only secondary or less education. Table 1 presents the descriptive statistics.

⁴ Migrating unit in this context includes all members of the family migrating to Australia under the same visa application. The term spouses is used for husband/wife, civil partners, fiancé(e)s and de facto partners.

Table 1: Sample characteristics – Primary applicant aged 20 to 65

	Cohort 1	Cohort 2
	Wave 1	Wave 1
Age	34.34	35.73
Experience	14.78	16.05
Experience 2	294.00	343.95
Gender (Female)	.373	.420
Married	.716	.713
No. of children in household	1.58	1.57
Education: Postgraduate	.237	.261
Education: Bachelor	.331	.313
Education: Diploma/Certificate	.432	.426
FHC: English Speaking OECD	.188	.192
FHC: Non-English Speaking OECD	.124	.148
FHC: South, East, South East Asia & Oceania	.335	.367
FHC: Sub-Saharan Africa	.061	.071
FHC: Other	.293	.222
Qualification assessed	.368	.283
Foreign Education: UK, Ireland	.160	.146
Foreign Education: EU/EEA	.094	.104
Foreign Education: Russia, fmr USSR, Oth Europe	.160	.155
Foreign Education: MENA	.093	.053
Foreign Education: SE Asia and Pacific Islands	.111	.143
Foreign Education: China, East Asia	.118	.134
Foreign Education: South Asia	.087	.091
Foreign Education: US, Canada	.074	.071
Foreign Education: Latin America	.050	.033
Foreign Education: S Africa	.054	.070
LFS AU: participate	.676	.660
Self-employment	.094	.103
Unemployed in 12 months pre-migration	.074	.064
Unemployed in first 5 months post-migration	.228	.112
Average hourly wage (log)	2.39	2.54
Interview in English	.718	.745
Visited Australia before immigration	.470	.546
Visa type: Preferential Family/Family Stream	.323	.424
Visa type: Concessional Family/Austr. Link	.212	.134
Visa type: Business Skills & Empl. Nom. Scheme	.131	.149
Visa type: Skilled Independent	.231	.157
Visa type: Humanitarian	.104	.138
HH owns car	.716	.571
Funds at time of immigration (log)	6.35	6.58
Educ. Mismatch AU: Over-educated	.265	.234

Educ. Mismatch AU: Correctly matched	.649	.671
Educ. Mismatch AU: Under-educated	.086	.095
Region of residence: New South Wales, ACT	.455	.437
Region of residence: Victoria	.230	.223
Region of residence: Queensland	.111	.102
Region of residence: S Australia, Tasmania	.072	.078
Region of residence: Western Australia, NT	.133	.160
No. of observations	3,208	1,179

Note: FHC stands for “Formal Home Country”.

The majority of immigrants in the sample are in prime working (about 35 years old), with about 15 years of work experience. They are mostly married, with one or two children. Just over a third are women, possibly reflecting the higher score obtained by younger and highly educated wives in the case of a couple applying for migration. About 40% of the immigrants in the sample have a vocational education degree as highest completed educational level (about a third in the original LSIA database). Immigrants’ schooling is completed in a wide variety of geographic areas. Those using English as the official language (UK/Ireland, US and Canada) account for about a quarter of the observations in the sample (New Zealanders are not part of the LSIA as they can enter/leave Australia with no restrictions on labour market access). In about a third of cases, the foreign qualification is formally assessed by DIAC. Most immigrants were interviewed in English confirming their high level of language skills.

MORE COMMENTS ON VISA

4. Methodology

The methodological basis is Mincer’s earnings function (Mincer, 1974), separately estimated for technical/professional diploma or certificate (TECH) and tertiary education (UNIV) just for broad comparison purposes. For tertiary education years of work experience are proxied by the difference between the individual’s age and 23, 21, and 20 years, respectively, if the

immigrant has completed a higher degree, a post-graduate or a graduate degree. For technical and professional education, courses last on average between 6 months and 1 year for a Trade certificate to 2 years for a Diploma or an Advanced Diploma. In the case of Germany and other central European countries, a vocational education degree ordinarily lasts 3.5 years. To approximate experience after vocational education completion experience is obtained by removing 18 and 17 years, respectively, from those completing Diploma/Advance Diploma, and those completing a Trade Certificate. These educational durations reflect Australian standards as per the Australian Qualifications Framework, which defines goals and broad characteristics for each level of education. This is of course an imperfect approximation of each immigrant's actual experience post vocational education, but it reflects DIAC's methodology in assessing foreign qualifications. As is standard, both exp_i and exp_i^2 are included as regressors to allow for earnings to grow at a decreasing rate over the working life of the interviewee.

Also included as regressors are dummy variables indicating the gender of the interviewee ($gender_i$), marital status ($married_i$), and number of children residing with the migrant (ch_resid_i). Additional dummy variables for interviews conducted in English ($ileng_i$) and car ownership (car_i), and the log of the funds brought to Australia (log_fund_i), control for the ability to undertake a wide range of labour market opportunities. Dummy variables are also used to control for the geographic area of birth (Non-English Speaking OECD, Asia, Africa, Latin America) using English-speaking OECD countries as the reference group (UK, Ireland, USA, and Canada).

To identify various visa categories, using family reunification as the reference, dummy variables are used to distinguish permanent settlement via Concessional Family (Con_Fam_i), a sponsored-visa class extinguished in 2012, Business and Employer Nomination Scheme (Bus_i), for foreign employees sponsored by an Australian employer, Skill Independent

(*Sk_Ind_i*), which operates Australia's selective immigration through points awarded to a candidate's immediate employability in Australia, and Humanitarian (*Hum_i*), for individuals whose main motivation to relocate to Australia is not economical.

The highest educational attainment is distinguished via dummy variables according to the geographic area where it was completed using Russia and a broad group of countries constituting the former USSR as a reference group. Separate dummies are created for the UK/Ireland, the EU/European Economic Area, MENA states, South East Asia and the Pacific Islands, China and East Asia, South Asia, the US/Canada, Latina America, and the rest of Africa. A separate dummy is also used to identify if the immigrant's qualification was assessed by DIAC upon settlement in Australia (*qual_as_i*).

The dependent variable is the hourly wage of the interviewee. While the LSIA survey collects data on the exact number of hours worked, the precise wage and salary details are not collected. Rather, the survey presents respondents with a schedule of bands of wages and asks them to identify in which band their earnings lie. Consequently, for each individual, instead of observing the weekly earnings, we observe one of the twelve separate categories in which they are reported. The lowest category is \$1 to \$57 a week; the highest \$962 or more a week. These values are divided by the individual hours of work that an immigrant undertakes per week to obtain the lower and upper bounds of the hourly earnings. For example, the two bounds for an individual indicating an income in the first category would be $\ln\left(\frac{\$1}{hours_i}\right)$ and $\ln\left(\frac{\$57}{hours_i}\right)$. The estimates are first carried out using a maximum likelihood approach that explicitly considers the imperfect observability of the dependent variable. This model is referred to as an Interval Regression by Wooldridge (2001). Standard arguments (see, e.g. Greene, 2003) establish the consistency and asymptotic normality of this estimator.

[MISSING:

1. DISCUSSION ON TESTS ON ENDOGENEITY OF EDUCATION – IT IS NOT POSSIBLY BECAUSE OBTAINED PRIOR TO THE DECISION TO MIGRATE;
2. DISCUSSION OF TWO-STEP MODEL CATERING FOR ENDOGENEITY OF QUALIFICATION ASSESSED FOR OVER-EDUCATION]

5. Results

The estimates of the wage equation are presented in Table 2.

Table 2: Estimates (Ln Hourly Wage is dependent variable)

Variables	Vocational Education	Tertiary Education
<i>Visa category</i>		
Conc_Fam	0.0370 (0.0808)	0.205** (0.0920)
Bus	0.520*** (0.102)	0.531*** (0.0853)
Sk_Ind	0.193*** (0.0748)	0.332*** (0.0807)
Hum	0.258 (0.224)	0.162 (0.224)
<i>Highest education completed in</i>		
UK/Ireland	0.510** (0.243)	0.472*** (0.136)
European Union/Eur. Ec. Area	0.342 (0.244)	0.321** (0.145)
Russia and fmr USSR	0.350 (0.252)	0.180 (0.172)
MENA countries	0.140 (0.276)	-0.258 (0.228)
South East Asia and Pacific Isl.	0.349 (0.249)	-0.0730 (0.153)
China and East Asia	-0.0369 (0.309)	-0.0967 (0.165)
South Asia	0.116 (0.244)	-0.234 (0.184)
USA/Canada	0.715*** (0.251)	0.489*** (0.131)
Africa	0.496* (0.267)	0.170 (0.180)
Qualification assessed in AUS	0.470* (0.261)	-0.234 (0.265)
Interactions		
Qual x UK/Ireland	.025	-.033

	(.088)	(.091)
Qual x European Union/Eur. Ec. Area	.246	.042
	(.158)	(.147)
Qual x Russia and fmr USSR	.202	-.293
	(.318)	(.193)
Qual x MENA countries	-.561**	-.249
	(.218)	(.282)
Qual x South East Asia and Pacific Isl.	.005	-.167
	(.135)	(.161)
Qual x China and East Asia	.127	-.052
	(.310)	(.148)
Qual x South Asia	.147	.289*
	(.109)	(.172)
Qual x USA/Canada	-.168	-.292*
	(.246)	(.170)
Qual x Africa	-.039	.187
	(.160)	(.189)
Controls		
Demographics	Yes	Yes
Pre-migr. knowledge AUS	Yes	Yes
Access to L-mkt AUS	Yes	Yes
Self-employed	Yes	Yes
Year of arrival	Yes	Yes
Labour market status	Yes	Yes
State of residence	Yes	Yes
Nr Observations	470	763
Log-likelihood	-1,004.58	-1,493.02
Wald-chi2	286.86	260.86
P-value	0.0000	0.0000

Notes: Standard errors are in parentheses. The dependent variable is a dummy to indicate over-education. * significant at 10%; ** significant at 5%; *** significant at 1%.

MISSING:

1. RESULTS ON ENTREPRENEURSHIP
2. RESULTS ON OVER-EDUCATION

AND DISCUSSION OF THE RESULTS, AND ROBUSTNESS CHECKS

6. Discussion and Conclusions

TO BE COMPLETED

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