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English Proficiency and Labour Supply of Immigrants in Australia

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Abstract

This paper explores the impact of English proficiency on the labour supply of recent immigrants in Australia. While previous research finds that English proficiency is crucial for participation and employment of immigrants, almost no research, and none in Australia, has been done with respect to hours worked by immigrants. The number of hours worked by immigrants is a strong indicator of economic wellbeing. This study uses the second cohort of the Longitudinal Survey of Immigrants to Australia data to estimate a Chamberlain style Tobit random effects estimator. The results suggest a positive relationship between English proficiency and hours worked by immigrants.

JEL classifications: C23, C34, O15, J22

1. Introduction

Migrants' language proficiency is a crucial factor influencing their earnings. For example, migrants with better language skills tend to earn more (McManus, Gold and Walsh 1983; Chiswick 1984, 1986, 1991; Chiswick and Miller 1988, 1995). This positive relationship partly stems from the fact that migrants with better language skills are more likely to be employed (Miller 1986; Wooden and Robertson 1989; Stromback, Chapman, Dawkins and Bashe-Jones 1992). Moreover, this relationship is particularly true for male immigrants (Brooks and Volker 1985; Inglis and Stromback 1986).

While considerable research has shown the importance of English ability with respect to wages, participation and employment of migrants, few Australian

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studies (Shamsuddin 1998; Cobb-Clark and Connolly 2001) have examined the relationship between English ability and hours worked by immigrants. This implies an important opportunity for a research contribution because participation and employment are relatively poor measures of immigrant labour supply. Data on labour force participation include both the employed and those who seek employment but do not have a job.

An employed person can also be underemployed, that is, he or she works fewer hours than they would prefer. One of possible scenarios is that an individual could earn less income than necessary for family living, although there is no established relationship between underemployment and adequacy of family income. Thus, hours of work are another important measure of labour supply that complements participation and employment. An empirical analysis of this issue is important to understand immigrants' early labour market experience immediately after immigration. The number of hours immigrants work is closely linked to their earnings.

To the author's knowledge, only two studies consider hours of work. For instance, Shamsuddin (1998) finds that female immigrants from Non-English Speaking Backgrounds (NESB) have a lower probability of being employed, but among the sub-sample of employed women, they work more hours per year than those with an English Speaking Backgrounds (ESB). Shamsuddin, however, did not examine the impact of different levels of English proficiency on hours worked by immigrants. The other study by Cobb-Clark and Connolly (2001) uses Longitudinal Survey of Immigrants to Australia (LSIA) data to examine

the role of the family in the immigrant settlement process by assessing the labour supply behaviour of immigrant spouses only. They find a positive relationship between English ability and hours worked by immigrant spouses.

This study improves on previous research in two aspects. First, three levels of English proficiency are examined: native English speakers, immigrants who speak English well, and those who speak it poorly. This can reveal how much language skills contribute to hours of work by immigrants. Most importantly, for the first time, both male and female Primary Applicants² (PAs) are included for a broader picture of immigrants' language ability and their labour supply. Therefore, the goal of this research is to seek econometric evidence to understand the direction and magnitude in which English proficiency affects hours worked by immigrants. A Chamberlain-style random effects model is estimated, using the second cohort of LSIA.

Weekly or yearly hours of work are often thought to be determined by both the demand side and supply side of the market. Altonji and Paxon (1986) find that while the labour supply preferences of employees must be satisfied in the long run, most of the short-run changes in hours of work seem to emanate from the demand side of the market. This paper examines immigrants' labour market behaviour six and 18 months after arrival, arguably in the domain of short to medium run. Moreover, the paper examines the labour outcomes of primary

² The PA is the person upon whom the approval to immigrate was based. The groups of persons who migrate as part of the PA visa application are known as the migrating unit (MU). The term *Primary Applicant* (PA), replaced the term *Principal Applicant* in 1996. Documentation for LSIA2 uses the term *Primary Applicant*, whereas documentation for LSIA1 uses *Principal Applicant*. This reflects the term in use at time of sample selection and initial interview (see LSIA User Document for more details).

applicants who recently arrived in Australia. The immigration authority assessed each applicant's skills and determined their suitability to work in the Australian labour market. Thus, they are more likely to be the major income earners in the family unit. As a result, the demand side effect is expected to be greater than the supply side effect on hours worked by these migrants.

English proficiency is found strongly and positively related to hours worked by immigrants, while controlling for other individual characteristics and structural variables. Employed immigrants who speak English "well" were employed on average 3.7 hours per week less than native speakers, while speaking English "poorly" decreased work by more than 6.8 hours per week. For men, the effect of English ability was more pronounced than for women.

The study is organised as follows: Section two outlines some economic theories of language proficiency and labour supply. Section three reviews the existing policy on migrants' English proficiency, while an overview of the LSIA data is presented in section four. Section five presents the econometric evidence on labour supply of immigrants. Then Section six identifies the possible problems associated with econometric analysis. Finally, the empirical results are discussed and conclusions are derived.

2. Economic Theories of Language

This section presents a theoretical background that helps explain the economic function of language for immigrants. Spoken language has two main functions. One is that language acts as a communication tool among agents. Lack of common language can be viewed as a barrier to trade; not overcoming this

barrier will incur transaction costs. Consequently, a competitive market will force all other languages to die out and select one, economically most important business language in the long run. In the short run, however, those transaction costs which cannot be eliminated will be borne by the minority group (Lang 1986). The other function is that language helps identify cultural affinity and reflects trust (Doney, Cannon and Mullen 1998), because of the common expectations and customs of potential traders, and thus achieves higher economic returns in a society. The second function of language directly links to the theory of discrimination.

Becker's (1957) seminal *The Economics of Discrimination* began the modern economic analysis of discrimination, which was then extended by Arrow (1972, 1974). Becker and Arrow suggest that a particular group may experience discrimination from their employers, co-workers or customers. Employers or co-workers have to be compensated to work with someone they prefer not to be associated with. Therefore, in the short run, the Becker-Arrow model predicts that racial prejudice causes employers to believe people from minority groups more expensive than they truly are. However, their model has two drawbacks. First, it is inadequate to explain discrimination by tastes, since all economic activities can be explained by the appropriate utility function. Second, in a competitive setting one would expect that the prejudiced employers are driven out of the market in the long run because they sacrifice profit by only retaining and hiring more expensive workers from the majority group.

Admitting these difficulties, Arrow (1974) and Phelps (1972) proposed an alternative model in which the employer discriminates against a minority group if he or she believes them to be less productive. The equilibrium, however, is regarded as unstable by most economists. There exists equilibrium only if the minorities are truly less productive (Lang 1986). Arrow's model of statistical discrimination was extended by Aigner and Cain (1977), who assume both groups have the same average productivity, but employers observe the minorities' productivity with greater error. However, none of the models provides a sufficient explanation of the persistence of discrimination. Lang (1986) presented a language model of discrimination that assumes the cost of integrating the workforce is the cost of allowing employees from different speech communities to speak the same language. The discrimination could be reflected in a negative impact on migrants' labour force outcomes, leading to a decline in hours worked by immigrants.

Language skills are a form of human capital that positively affects immigrant earnings and labour market opportunities (Kossoudji 1988). From human capital theory it is often costly to learn a second language. These costs will include factors such as the out-of-pocket or direct expenses, forgone earnings that arise during the language learning period and psychic losses that occur since learning is often difficult. However, proficiency in the majority group's language can signal a person's employability during the job interview. Hence investment in learning the majority's language will be made by the minority, if interaction between the two groups is required. The findings from Table 4 may be a result of investment in the majority's language by a minority—that individuals with

the least English ability exhibit larger changes in their English proficiency 18 months after arrival. Table 5 shows that immigrants who are able to improve their English skills will increase their hours worked more than those whose English remains unchanged or worsens.

In summary, both human capital theory and discrimination theory help explain why language proficiency in the destination country is associated with the positive labour outcomes of immigrants.

3. Government Policies on Language Requirements

In response to negative implications of language, the Australian immigration acceptance process adopted, in July 1999, a stricter English proficiency requirement to emphasise the productivity-related characteristics in the immigrant selection process. Until recently, all skilled category applicants were required to take the International English Language Testing System (IELTS) test. The Evaluation of General Skills Migration (GSM) Categories recommends the threshold English language level be raised to a minimum of 6 on all components of IELTS for GSM visas. For instance, when an overseas student applies for migration and obtains an overall score of 7 with a minimum of 6 in all subtests, he or she will gain a maximum of 25 points. Previously, applicants could demonstrate their English proficiency through other, less standardized means.³ Furthermore, the Federal Government recently proposed that, in addition to having to wait four years before obtaining citizenship, migrants would also have to take an English language test. Failure in this test

³ For example, this previously could be demonstrated by earning a degree from an institution in which English is the medium of instruction.

would prevent them from becoming citizens. This shows the Australian government’s increased emphasis on English proficiency for economic purposes.

During the migration process, only PAs were subject to the English ability test, and all other applicants were not required to undergo an English test. Hence, some non-PAs’ skills may not be marketable in the Australian labour market due to their lower English ability.

Table 1 Total Number of Hours Worked per week by English Proficiency⁴ – LSIA2.

English Ability	<u>6 months after arrival</u>		<u>18 months after arrival</u>	
	Mean	Std. Dev.	Mean	Std. Dev.
English Only	27.5	20.78	25.5	21.10
English Well	19.3	19.86	15.2	19.34
English Poorly	6.5	15.63	6.9	15.50
Total	18.5	20.91	16.5	20.42

Source: LSIA2

The second cohort (LSIA2) arrived between September 1999 and August 2000, and was interviewed twice. Table 1 matches the hours worked by migrants at six and 18 months after arrival with self-assessment of their English-speaking ability⁵ immediately after arrival. Six months after arrival, immigrants with English as the first language worked an average of 27.5 hours per week, whereas immigrants who spoke English “well” worked an average of 18.5 hours per week. Immigrants, who spoke English “poorly”, even six months after

⁴ Five levels of English-speaking skills are identified. They are: 1) English only; 2) speaks English very well; 3) speaks English well; 4) speaks English not well; 5) and speaks English not at all. In this study, the second and third categories are integrated into one category--- English well, and the last two categories are combined into one category--- English bad.

⁵ The interviewers ask respondents how well they would say they speak English.

arrival, worked an average of only 6.5 hours per week. This shows that the more proficient immigrants were at speaking English, the more hours they tended to work. One and half years after arrival, this pattern persisted. These findings set an important context in which this study enquiry is located.

4. Longitudinal Survey of Immigrants to Australia

Data

The Longitudinal Survey of Immigrants to Australia (LSIA) documents recently arrived immigrants via offshore applications managed by the Department of Immigration and Citizenship. The purpose of carrying out this survey is to provide data to examine and evaluate immigration and settlement policies, programs and services. In the survey, the same individuals were studied at different stages of these processes to fully understand immigration and settlement.

The LSIA consists of two entry cohorts.⁶ The first cohort of the LSIA (LSIA1) was selected from offshore visa immigrants to Australia, who arrived in the two-year period from September 1993 to August 1995. In LSIA1, immigrants were interviewed three times. The first wave of interviews commenced in March 1994 (approximately five to six months after arrival). The second wave of interviews commenced in March 1995 (one year later). The third wave of interviews commenced in March 1997. Each wave of interviews was spread over a two-year period. 5,192 PAs aged 15 years and over were included in the

⁶ New Zealand citizens, immigrants granted a visa while resident in Australia, immigrants who had special eligibility visas (e.g. former Australian citizens) and immigrants who did not have an identifiable country of birth are not included in the survey population.

LSIA1 sample. This represents around seven per cent of the total in-scope PAs that arrived in the two-year survey period.

In 1997, the Australian government introduced a radical reform to immigration policies: all immigrants (except humanitarian migrants) had previously been denied access to welfare payments and Austudy⁷ during the first six months after their arrival in Australia, but in 1997 this period was extended to two years (and access to the Special Benefit was almost removed). Following the policy changes, LSIA1 results no longer reflect the experiences of more recent migrants. Thus LSIA2 was surveyed to evaluate the effects of the policy change.

A specific goal is to evaluate the effects of extending from six months to two years the time after arrival before migrants become entitled to most social security benefits. According to labour supply theory, this change would cause a higher proportion of recent immigrants to more actively search for employment. As a result, the two cohorts might behave differently in the Australian labour market due to the unobserved incentive while other variables are being held constant. Otherwise, it would be interesting to compare the effects of English ability on migrants' labour supply based on cohorts 1 and 2. This study only uses cohort 2 to analyse the immigrants' labour supply because they were less likely to depend on welfare. Moreover, this study only examines immigrants aged between 15 and 65 years old, because people of working age are of interest.

⁷ Austudy provides financial support for tertiary education students.

There are 3,124 primary applicants included in the LSIA2 sample. This represents around 10 per cent of the total in-scope PAs that arrived in the one-year survey period. In LSIA2, immigrants were interviewed twice. The first interview was conducted in March 2000, and the second interview commenced in March 2001. Each wave of interviews occurred over a one-year period.

Non-humanitarian immigrants can be classified into two groups: Preferential Family/Family Stream, strictly based on family relationships; and all other categories based on potential labour market outcomes, including Independents⁸, Employer Nomination Scheme⁹ (ENS), and Business Skills.¹⁰ The Preferential Family category assesses individuals on the basis of both their family connections and their skills.

Data used previously—*1981 The Census of Population and Housing* (Brooks and Volker, 1985; Inglis and Stromback, 1986), *Man Power Program Survey* (Miller 1986), *1987 ABS Characteristics of Migration Survey* (Wooden and Robertson, 1989)—were insufficient in providing researchers with a satisfactory picture of the immigrant settlement process due to the cross-sectional nature of the data. LSIA, however, which tracks each individual through time, is particularly useful in answering questions about the dynamic change of migrants. Therefore, the availability of LSIA data has given researchers a unique opportunity to investigate immigration to Australia at an individual level.

⁸ For those who pass the points test and do not have a family relationship.

⁹ For those who have pre-arranged employment with an Australian employer.

¹⁰ For those who meet certain capital requirements and wish to settle in Australia and develop new or existing businesses.

Key Variable and Descriptive Analysis

The dependent variable in the model is the weekly hours of work in the main or most recent job. In the LSIA survey, the interviewers ask “thinking firstly about your main/most recent job, how many hours do/did you usually work each week in this job?” Multi-job holding is possible, however less than one per cent of the sample has two or more jobs. The estimation should not be affected by much. Therefore, for simplicity, multi-job holding is not taken into account.

Table 2 presents means and standard deviations of some selected background variables of cohort 2 PAs by gender. The data show substantial differences in some variables between men and women. For example, about 75 per cent of men were employed before migration, while only 60 per cent of women were employed before migration. Moreover, the non-participation rate is much higher for women (38 per cent) than men (22 per cent). In terms of English ability, the proportion of native English speakers and immigrants who speak English well is higher for men than women. This is partly due to a higher number of women (39 per cent) coming from North and East Asia where English is mostly not the first language, compared to 28 per cent of men coming from the same region. In addition, more women (45 per cent) tend to stay in NSW than men (36 per cent), while men (29 per cent) are more likely to stay in Victoria than women (21 per cent).

5. Econometric Evidence

Empirical Framework¹¹

In the econometric analysis documented below, the average number of labour hours per week is the dependent variable. This is left censored at zero. The censoring causes problems: an OLS regression¹² using only the uncensored observations produces inconsistent estimators. A random effect Tobit model can solve this problem, but the model does not allow unobserved heterogeneity to be correlated with independent variables (e.g. ability). Therefore, a Chamberlain-style random effect Tobit model is employed to reduce the possible unobserved heterogeneity problem. This model is somewhat equivalent to a fixed effect Tobit model. The Tobit fixed effects model proposed by Honoré (1992) is not used for two reasons.

Table 2 Family Stream Human Capital Endowment, LSIA2^a (Means and Standard Deviations)

	Cohort 2		Men		Women		Diff.
	Mean	Std. Dev	Mean	Std. Dev	Mean	Std. Dev	
Weeks Since Migration	21	5.1	22	5.1	21	5.1	1***
Demographic							
Female (%)	61	0.5	-	-	-	-	
Age	32	11.2	32	11.2	31	11.1	1***
Married (%)	68	0.5	66	0.5	69	0.5	-3***
LM Experience Before Migration	(%)		(%)		(%)		
Employed before migration	66	0.5	75	0.4	60	0.5	15***
Unemployed before migration	3	0.2	3	0.2	3	0.2	0
Non-Participant before migration	32	0.5	22	0.4	38	0.5	-16***
No Work Experience	33	0.5	24	0.4	39	0.5	-15***
WE less than 1 year	15	0.4	14	0.4	15	0.4	-1***
WE between 1 and 2 years	12	0.3	14	0.3	11	0.3	3***
WE between 2 and 5 years	19	0.4	22	0.4	16	0.4	6***
WE greater than 5 years	22	0.4	26	0.4	19	0.4	7***

¹¹ This section is based on Greene (2003).

¹² OLS and Random Effects Tobit regressions have been done for comparison purposes in the table section.

Professional before migration	47	0.5	50	0.5	45	0.5	5***
Skilled before migration	40	0.5	38	0.5	41	0.5	-3***
Unskilled before migration	13	0.3	12	0.3	13	0.3	-1***
Prior Visit to Australia	47	0.5	50	0.5	45	0.5	5***
English Ability	(%)		(%)		(%)		
Native speaker	23	0.4	28	0.4	20	0.4	8***
English well	38	0.5	36	0.5	38	0.5	-2***
English not well	39	0.5	36	0.5	42	0.5	-6***
Education	(%)		(%)		(%)		
Higher degree	6	0.2	7	0.2	6	0.2	1***
Post graduate diploma	4	0.2	3	0.2	4	0.2	-1***
Bachelor degree or equivalent	19	0.4	18	0.4	20	0.4	-2***
Tech/prof qual diploma/certificate	22	0.4	21	0.4	22	0.4	-1***
Trade	5	0.2	8	0.3	2	0.2	6***
12 or more years of schooling	21	0.4	22	0.4	21	0.4	1***
Schooling below year 12	23	0.4	20	0.4	24	0.4	-4***
Country of Birth	(%)		(%)		(%)		
Oceania	5	0.2	5	0.2	4	0.2	1***
UK & Ireland	7	0.3	8	0.3	6	0.2	2***
Southern Europe	4	0.2	6	0.2	2	0.2	4***
Western Europe	5	0.2	6	0.2	4	0.2	2***
Northern Europe	4	0.2	5	0.2	4	0.2	1***
South & Eastern Europe	10	0.3	7	0.3	12	0.3	-5***
North Africa & Mid East	8	0.3	8	0.3	7	0.3	1***
Southern Asia	4	0.2	3	0.2	4	0.2	-1***
North & East Asia	35	0.5	28	0.4	39	0.5	-11***
Southern & Central Asia	3	0.2	4	0.2	2	0.2	2***
Northern America	6	0.2	9	0.3	5	0.2	4***
South America	5	0.2	4	0.2	6	0.2	-2***
Central America & Caribbean	2	0.1	3	0.2	1	0.1	2***
Other Africa	4	0.2	5	0.2	3	0.2	2***
State of Residence	(%)		(%)		(%)		
NSW	41	0.5	36	0.5	45	0.5	-9***
Victoria	24	0.4	29	0.5	21	0.4	8***
Queensland	9	0.3	11	0.3	8	0.3	3***
South Australia	5	0.2	5	0.2	5	0.2	0
Western Australia	10	0.3	10	0.3	10	0.3	0
Tasmania	3	0.2	3	0.2	2	0.2	1***
Northern Territory	2	0.1	1	0.1	3	0.2	-2***
ACT	6	0.2	6	0.2	6	0.2	0

Note:

^a Sample size is 1403.

^b *** denotes the level of significance at 1%.

First, there is no variation in the English Best or Only category, one of the English-speaking proficiency categories. Second, because the dependent variable is over 50 per cent censored, this could cause problems for the median

regression like model (e.g. Tobit fixed effect model) without enough observations. All the demographic and structural variables are included. The wage variable, however, is not included as an explanatory variable in the model because of the possibility that wages and hours of work are jointly determined (Cobb-Clark and Connolly 2001). For example, people with higher wages work longer hours, on the other hand people working long hours also leads to higher wages. This also depends on the relative strengths of income and substitution effects. As a result, including the wage variable in the model could bias the estimates. Instead, human capital variables thought to determine wages (e.g. age, education etc) are included in the hour's model.

The model to be estimated is as follows:

$$\begin{aligned}
 y_{it} &= \max(0, \psi + x_{it}\beta_i + x_{i1}\xi_1 + x_{i2}\xi_2 + a_i + u_{it}) \\
 u_{it} | x_i, a_i &\sim \text{Normal}(0, \sigma_u^2), t = 1, 2 \\
 a_i | x_i &\sim \text{Normal}(0, \sigma_a^2)
 \end{aligned} \tag{1}$$

Where: y_{it} = Total weekly working hours of individual 'i' at wave t

x_{it} = Control variables for individual 'i' at wave t

x_{i1} = Control variables for individual 'i' at wave 1

x_{i2} = Control variables for individual 'i' at wave 2

a_i = Unobserved effect

u_{it} = Disturbance term

β, ξ = Vectors of unknown coefficients

ψ = Intercept

Note that a_i is assumed to be time-invariant, and t denotes wave 1 or 2.

Equation (1) is used as the econometric model for the panel analysis.

Conditional on (x_i, a_i) , the $\{u_{it}\}$ are serially independent and assumed to be normal with zero mean and constant variance σ_u^2 . The variables represented by x_{it} include: English proficiency, gender, age, age², level of education, marital status, number of children less than six years old, location, unemployed prior to migration¹³, visa status and country of origin. Next, x_{i1} and x_{i2} include all the independent variables except for being unemployed prior to migration, visa status and country of origin for each time period. Thus the model assumes that there is an underlying, stochastic index y_{it} which is observed only when it is positive, and hence qualifies as an unobserved, latent variable.

It is not appropriate to interpret the Tobit coefficient as OLS. The Tobit coefficients can be decomposed into two effects: the total effect—the change in dependent variable for those above the limit, weighted by the probability of being above the limit; and the conditional effect—the change in the probability of being above the limit.

$$\begin{aligned} E(y|x) &= F(z)\beta \\ E(y|y > 0, x) &= (1 - zf(z)/F(z) - f(z)^2/F(z)^2)\beta \end{aligned} \quad (2)$$

Where $z = X\beta/\sigma$, $F(\cdot)$ is the standard normal cumulative distribution function (CDF) and $f(\cdot)$ is the standard normal probability density function (PDF). Each of the terms in equation (2) is evaluated at the mean of the x 's, \bar{x} . $F(z)$ is the

¹³ LSIA does not distinguish being unemployed and not in the labour force which means that a more disaggregated analysis is not possible.

fraction of the sample above limit¹⁴ whereas $(1 - zf(z) / F(z) - f(z)^2 / F(z)^2)$ is the fraction of the mean total response due to responses above limit.

For given values of x , $E(y|y > 0, x)$ is the expected value of y for the subpopulation where y is positive. This refers to the employed as the time of survey, whereas $E(y|x)$ includes both the employed and unemployed. Both total effects and conditional total effects from each Tobit model are reported in Table 3. Random effects Tobit and OLS models are also estimated for comparison purposes and are available on request. All standard errors are robust to heteroscedasticity.

Empirical Results

We first estimate a model for all immigrants and report unconditional and conditional marginal effects. As males and females have different labour supply

Table 3 Chamberlain Style Random Effects Tobit Regression Results – Weekly Total Hours Worked by Immigrants Age 15-65, LSIA2^{abc}

	All			Male			Female		
	Coef.	Unco. ^d	Cond. ^e	Coef.	Unco.	Cond.	Coef.	Unco.	Cond.
English Ability (English Only)									
English well	-10.26 [4.43]	-5.09 [2.12]	-3.72 [1.57]	-7.36 [5.57]	-4.80 [3.56]	-3.37 [2.51]	-12.49 [7.53]	-3.99 [2.29]	-3.42 [2.01]
English poorly	-19.45 [5.28]	-9.14 [2.26]	-6.80 [1.75]	-17.23 [6.73]	-10.62 [3.80]	-7.51 [2.75]	-21.41 [8.79]	-6.61 [2.52]	-5.76 [2.28]

Note:

^a Sample size is 4331 for all immigrants, 2219 for men and 2112 for women..

^b Base variables are in the round bracket and t-statistics in square brackets.

^c All the estimates on x_{i1} and x_{i2} are omitted from the table .

^d This includes immigrants who initially do not work.

^e This includes immigrants who originally work.

¹⁴ The limit is zero in this case.

^f Other independent variables include age, age², marital status, number of kid less than six, education, state of residence, country of origin, visa category and employment prior to migration.

behaviours, we also estimate two models for males and females separately. The signs of the estimated coefficients on all the variables are mostly consistent with those reported in Cobb-Clark and Connolly (2001), although the magnitudes are different since they analysed immigrants' spouses, whereas we analyse the primary applicants.

Since we are interested in the latent index, the hours of work should be interpreted as *desired* hours of work. Conditional on hours being positive, immigrants who speak English "well" were employed on average 3.7 hours per week less than native English speakers, while speaking English "poorly" decreased work by more than 6.8 hours per week in 2000. For men, the effect of English proficiency was somewhat more pronounced, decreasing hours worked by 3.4 to 7.5 hours per week. For women, this effect was smaller, decreasing hours worked by 3.4 to 5.8 hours per week. The magnitude was larger for unconditional effects, but the same pattern was still preserved. This result suggests that the more proficient at English an immigrant is, the more hours he or she works.

6. Sensitivity Analysis

There are five English-speaking proficiency categories: English only, English very well, English well, English not well and English not at all. They are ranked

and mutually exclusive. These rankings are self-reported¹⁵. English very well and English well are now combined into English well, and English not well and English not at all are united into English poorly¹⁶.

Table 4 English Proficiency of Immigrants by Waves, LSIA2

6 months after arrival	18 months after arrival			Total
	English Only	English Well	English Poorly	
English Only	952	1	0	953
English Well	108	968	35	1,111
English Poorly	6	337	915	1,258
Total	1,066	1,306	950	3,322

Source: LSIA2

As expected, almost no one has switched from English Only to other English proficiency categories within 12 months. This is because a native English speaker's English skills are unlikely to worsen in an English-speaking country. Of the 1,111 immigrants who initially spoke English well, 108 immigrants improved their English, while 35 immigrants' English worsened, and 968 immigrants' English skills remain unchanged. Of the 1,258 immigrants who initially spoke English poorly, 343 immigrants improved, six having improved substantially, but 915 could not speak English well even 18 months after arrival.

¹⁵ This variable is based on self-reporting that may lead to measurement error, as the interviewees could either understate or overstate their English ability for various reasons.

¹⁶ While collapsing the English language variables increases the test power of the regression, a less aggregated treatment of these effects is of interest for future research.

Table 5 Changes in Total Number of Hours Worked per week by Waves and English Proficiency – LSIA2.

6 months after arrival	18 months after arrival		
	English Only	English Well	English Poorly
English Only	7.1 [21.17]	- -	- -
English Well	10.9 [21.67]	7.7 [20.57]	7.0 [13.28]
English Poorly	10.0 [16.73]	5.4 [17.72]	3.3 [13.60]

Native English speakers increased their labour supply by an average of 7.1 hours per week. Of the immigrants who originally spoke English well, those whose English improved worked an average of 10.9 more hours, while those whose English worsened worked seven hours less, and those whose English remained unchanged worked 7.7 hours more per week. Of the immigrants who initially spoke English poorly, those who improved their English substantially increased their work hours by 10 on average, while those whose English improved to ‘well’ worked 5.4 more hours, and those who still could not speak English well 18 months after arrival only increased work by 3.3 hours. The data suggest that immigrants who are able to improve their English skills will increase hours worked more than those whose English skills remain unchanged. The latter are still able to increase hours worked more than those whose English skills worsen.

A random effects test is necessary to know the appropriateness of the fixed effects estimation (Chamberlain style random effects Tobit estimation in this case). There are two ways of doing this test. First, a joint significant test is undertaken on all estimated coefficients on x_{i1} and x_{i2} . The tests are significant

at a level of one per cent for all three models. Second, two regressions were conducted with and without time-constant variables. If the individual random effects have been controlled for, then whether or not the fixed effects are included in the model should not matter. The difference in the estimated coefficients in two specifications is small. Therefore, both tests suggest that the fixed effect estimation (Chamberlain-style random effects Tobit estimation) is appropriate for the model.

In section V, it is mentioned that a wage variable is not in the model due to the endogeneity concern. However, wage and family income variables are added into the model for a robustness check. The coefficients on wage and family income variables are negligible and statistically insignificant. On the other hand, the sign and size of some coefficients have changed, for example, demographic variables and state of residence. However, the coefficients on the main variable of interest, English ability, have barely changed. The results show that the regression is robust. The model incorporating wage and family income variables only works for male and for female combined as it fails to converge when looking at male and female separately. A possible explanation is that the sample size is too small.

The robustness of the results has also been checked by restricting the sample to workers aged between 25 and 60 years old. The coefficients from the regression have the same signs as the full sample, but the absolute values of the coefficients are larger.

7. Conclusion

In conclusion, previous studies have found that English proficiency was crucial for immigrants' labour market outcomes. However, few have examined the impact of English proficiency on hours worked by immigrants. This is an important opportunity to contribute to the literature. To the author's knowledge, this is the only study that examines the impact of English ability with regards to hours of work for both male and female Australian immigrants. Hours of work are another facet of labour supply measurement in addition to participation or employment. While a person is employed, he or she can be underemployed. As a result, the person may not be matched to an optimal job.

The results show that English proficiency is correlated with a migrant's decision to work. The better English migrants have, the more hours they work in the labour market. Working immigrants with "well" English were employed on average 3.7 hours per week less than native speakers, while "poor" English speakers work on average 6.8 hours less per week. The effect of English ability for males was more pronounced than for women. There are two possible explanations for the phenomena: if interaction is required between two speech communities in the workplace, language serves as a communication tool among agents. Proficiency in the common language can reduce the barrier to trade. Language is also the way to identify cultural affinity and reflect trust, since the same expectations and customs of potential traders can reduce the transaction costs. Both explanations indicate that language is likely to serve as a signal of workers' employability to their employers.

These findings into the impact of English proficiency on hours worked by immigrants have implications for public policy. If foreign-born immigrants are proficient in the destination language, it is more likely they will be successful in the destination labour market. Immigration policy in Western countries already reflects this reality. For example, the Australian and Canadian Immigration Departments select skilled immigrants based on a point system. English requirements are a major component of the system. Hence, there may be benefits to modifying immigration policy to put more weight on the English proficiency of potential migrants. For instance, this change might increase the labour supply of new immigrants under the new policy. Alternatively, if the government subsidises linguistic training to incumbent immigrants with insufficient English skills, the immigrants would be expected to increase their labour supply as a result of having better English.

Future research prospects that should be considered or addressed include: (i) constraint of equivalent educational effects. For example, qualifications from different countries have the same effects here; (ii) endogeneity of hours worked and English ability. That is, people with better English work longer hours, on the other hand people working long hours also leads to better English.

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