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# *Language training, language proficiency and earnings of immigrants in Norway*

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This paper uses a simple probit model to determine the impact of language training on the language proficiency of Third World immigrant men in Norway. It also estimates the labour market returns to Norwegian language proficiency. The results show that immigrants who participate in language training programme are more likely to acquire speaking and reading proficiencies in Norwegian language than those who do not. Contrary to expectation, language proficiency has no significant effect on immigrants' earnings. A probable explanation may be that immigrants need Norwegian language proficiency to get into jobs in the Norwegian labour market. Once they are in employment, their wages are not necessarily determined by their proficiency in Norwegian. Consistent with the assimilation hypothesis, earlier waves of immigrants have higher earnings than do more recent waves, and part of the initial earnings deficit experienced by more recent immigrants can be attributed to language deficiency. There was no evidence of sample selection bias in the earnings equation.

## I. INTRODUCTION

Immigrants' earnings assimilation was first analysed by Chiswick (1978), and later refined by Borjas (1985). Chiswick concluded that immigrants earn less than their native-born counterparts during the initial period of their stay in the USA, but after 10–15 years they attain earnings parity with and then overtake the native-born. The initial immigrant earnings gap arises because skills are not easily transferred. Subsequently, immigrants invest in post-migration human capital that increases their productivity and earnings over time.

Language is one important element of post-migration human capital. Immigrants acquire language proficiency to be able to obtain relevant information about jobs and earnings, and to communicate their pre-migration skills to potential employers in the host country's labour market. Language also increases the productivity of immigrants who are already in employment. However, the means

through which immigrants acquire language skills has not been accorded the importance it deserves in the assimilation literature. Do immigrants acquire language proficiency through formal training (e.g., receiving language training) or through informal training (e.g., self-study) or both?

This paper examines, with the help of human capital theory, how language training affects immigrants' language proficiency in Norway. It also estimates the economic returns to Norwegian language proficiency. The paper focuses specifically on Third World immigrant men for the following reasons. First, Third World immigrants accounted for 11% of the total foreign-born population in 1975. By 1993 their number has increased by 41%.<sup>1</sup> Moreover, Third World immigrants accounted for 15–20% of total unemployment in the country. According to a survey conducted by Norsk Gallup (1993), the major employers in the country blamed the high unemployment among Third World immigrants on the lack of Norwegian language proficiency. Thus, the findings of

<sup>1</sup> The total foreign-born population increased from 61 806 or 1.5% of the total population in 1975, to 154 012 or 3.6% in 1993 (see Mosaikk, May, 1994).

this study would help explain why Third World immigrants perform poorly in the Norwegian labour market relative to Norwegians.

The paper proceeds as follows. Section II provides a review of the previous literature on immigrants' language acquisition. Section III presents the data and descriptive statistics, while the analyses of the impact of language training on Norwegian language proficiency are presented in Section IV. In Section V, the impact of language proficiency on immigrants' earnings is studied. Finally, section VI concludes the analysis.

## II. LANGUAGE ACQUISITION STUDIES

There has been considerable empirical work on immigrants' language acquisition in several countries. (See, e.g., McManus *et al.* (1983), Grenier and Vaillancourt (1983), Grenier (1984), McManus (1985), Kossoudji (1988), Chiswick (1991), Dustmann (1994, 1997), Chiswick and Miller (1995), Carliner (1995). This work has focused on the determinants, returns to language capital, and policy measures. Using cross-sectional data from four different countries, Chiswick and Miller (1995) conducted a comparative study, where they found that the rate of return to language capital is higher (17%) for immigrant men in the United States than for those in Australia (5–8%), Canada (12%) and Israel (11%). Using data from the German Socio-Economic Panel (GSOEP), Dustmann (1994) found that male and female immigrants with above average speaking fluency earn 6.9% and 7.1% more than those with deficiency in the German language. Similarly, male and female immigrants with above average writing fluency in the German language earn 7.3% and 15.3% more than those with deficiency in the German language.

Unlike the previous studies, Beenstock (1996) controls for language training in his ordered probit analysis of immigrants' language acquisition in Israel. He found that immigrants who completed language school in Israel improved their proficiency in speaking Hebrew relative to those who dropped out of language school, while the drop-outs also improved their speaking proficiency relative to nonparticipants. Beenstock did not examine the impact of language proficiency on immigrants' earnings.

Gonzalez (2000) also analysed data from the National Adult Literacy Survey (NALS) to determine the labour market returns to understanding, speaking, reading and

writing proficiency in English language. He found that completing ESL programme raises the English language proficiency of ethnic groups in the USA. His findings also indicate that there are higher returns to English proficiency than literacy. These findings suggest that failure to control for language instruction in studies that determine immigrants' language proficiency would result in an omitted variable bias. This paper avoids this problem by including two measures of language training in the language equation. These are participation and completion of language training programme.

## III. DATA AND DESCRIPTIVE STATISTICS

The survey data were collected in 1993. Questionnaires were mailed to 2000 men aged 17–65, from Morocco, Pakistan, Chile and are residents of Norway's two largest municipalities, Oslo/Akershus and Bergen. On the whole, 22.6% of the randomly drawn sample responded to the questionnaire. The questions asked include the following: 'Currently, how do you assess your Norwegian language proficiency?' 'Would you say: I understand Norwegian; I speak Norwegian; I read Norwegian; and I write Norwegian.' Respondents were to answer each of these questions on a scale with four levels: 'Very well', 'Well', 'Average' or 'Poor' respectively.<sup>2</sup>

The respondents were also asked to indicate whether they had received language training, and if yes, to indicate the number of hours of language lessons received. The hours variable was an interval variable: <240 hours, 240 hours, 240–500 hours, and >500 hours. Given that the minimum number of hours required to complete the language programme is 240, it is easy to consider individuals who received <240 hours as those who did not complete the language programme.<sup>3</sup> In addition to the information on language proficiency, the data has information on age at migration, year of arrival in Norway, actual work experience, pre- and post-migration education and language proficiency test. Most of these variables are not reported in census and other public use data files in the country. The few missing observations in the data were replaced with the mean value for the full sample.<sup>4</sup>

### *Descriptive statistics and variable definitions*

As shown in Table 1, the average immigrant has 11 years of schooling from the country of origin, migrated to Norway

<sup>2</sup> One criticism against the use of subjective (i.e., self-rated competence) rather than objective (e.g., language test) measure of an individual's language fluency, is that it can lead to under or overestimation of the actual language proficiency, since an immigrant is likely to judge his ability relative to a fellow immigrant, and not in comparison with a native-born Norwegian.

<sup>3</sup> Refugees are entitled to 750 hours of language training free of charge, while non-refugee immigrants are entitled to 240 hours.

<sup>4</sup> As argued by Greene (1993, page 244), '... there is information about the covariation between the regressors with complete data and the dependent variable that is not used if these (missing) observations are discarded.'

Table 1. *Description of variables and sample characteristics*

Age at migration	24.412	(8.035)	Reported age at arrival in Norway
Years since migration	8.198	(6.281)	1993 minus year of arrival in Norway
Refugee status	0.3086	(0.4624)	One, if individual has a refugee status; zero otherwise
Norwegian wife	0.2455	(0.4309)	One, if individual has a Norwegian wife, zero otherwise
English fluency	0.4189	(0.4939)	One, if individual understands or speaks English language fluently, zero otherwise
English literacy	0.3806	(0.4861)	One, if individual reads or writes English language fluently, zero otherwise
Post-migration education	0.4572	(0.4987)	One, if individual received formal education in Norway, zero otherwise
Part. lang. tr prog	0.9054	(0.2930)	One, if participated in the Norwegian language training programme; zero otherwise
Compl. lang. tr. prog	0.7951	(0.4041)	One, if received 240 hours or more of Norwegian language training, zero otherwise
Arabic	0.1982	(0.3991)	One if Arabic is the mother-tongue; zero otherwise
Spanish	0.2545	(0.4361)	One if Spanish is the mother-tongue; zero otherwise
Urdu	0.5158	(0.5003)	One if Urdu is the mother-tongue, zero; otherwise
Pre-migration education	11.459	(3.993)	Years of schooling acquired from the country of origin
Experience	12.979	(8.796)	Reported years of work experience
Experience squared	245.55	(300.55)	Reported years of work experience squared
Full time	0.7668	(0.4236)	One, if full time work; zero otherwise
Married wife present	0.7880	(0.4095)	One if married with wife present; zero otherwise
Children present	0.6148	(0.4875)	One if children are present in Norway; zero otherwise
Oslo	0.8693	(0.3377)	One if resident of Oslo/Akershus; zero otherwise
Secondary occupation	0.1449	(0.3526)	One if individual has other jobs beside main occupation; zero otherwise
Language test	0.1873	(0.3908)	One if individual took Norwegian language test prior to being hired; zero otherwise
1988–1992	0.2615	(0.4402)	One if individual arrived in Norway between 1988 and 1992; zero otherwise
1981–1987	0.4346	(0.4966)	One if individual arrived in Norway between 1981 and 1987; zero otherwise
Chile	0.2685	(0.4440)	One if individual was born in Chile; zero otherwise
Morocco	0.1873	(0.3908)	One if individual was born in Morocco; zero otherwise
Pakistan	0.5300	(0.5000)	One if individual was born in Pakistan; zero otherwise
Understanding proficiency	0.7809	(0.4144)	One if individual understands Norwegian well or very well; zero otherwise
Speaking proficiency	0.6042	(0.4899)	One if individual speaks Norwegian language well or very well; zero otherwise
Reading proficiency	0.6855	(0.4651)	One if individual reads Norwegian language well or very well; zero otherwise
Writing proficiency	0.4770	(0.5004)	One if individual writes Norwegian language well or very well; zero otherwise

at the age of 24 years, and has lived in the country for a period of 8 years. Similarly, an average immigrant has about 13 years of accumulated work experience. About 45.7% have obtained formal education in Norway. Of the 90% of immigrants, who participated in the language training programme, 79.5% completed the programme. Furthermore, 18.7% of them had to take Norwegian language proficiency test before being employed. About 24.5% have spouses who are Norwegians, while 61% of immigrants have children living in Norway. About 42% and 38% of immigrants reported English fluency and literacy respectively. Apart from the other Scandinavian

languages (i.e., Danish and Swedish), English language seems to be an important medium of communication in Norway.<sup>5</sup>

Before proceeding with the analysis, it is perhaps instructive to define certain key words, which would be used frequently throughout the paper. For instance, an individual is considered 'proficient' if he reported that he understands or speaks or reads or writes Norwegian language 'well' or 'very well'. Similarly, fluency is defined as one who is proficient in understanding and speaking Norwegian, while literacy concerns reading and writing proficiency in Norwegian language.

<sup>5</sup> Pakistan has English as the national language, but the language most spoken is the native language, Urdu.

#### IV. LANGUAGE TRAINING AND LANGUAGE PROFICIENCY

A probit model was used to determine the effects of language training on immigrants' Norwegian language proficiency. The model was as follows

$$LANG.PROF_{ij} = \alpha_0 + \alpha_1 LANG.TRAIN_{ij} + \alpha_2 COMPL_{ij} + \alpha_4 Z_{ij} + \nu_{ij} \quad (1)$$

where  $LANG.PROF_{ij}$  is assigned the value 1 if individual  $i$  reported proficiency in the language. The subscript  $j$  denotes understanding, speaking, reading and writing proficiencies respectively.  $LANG.TRAIN_i$  equals 1 if individual participated in the language training programme, while the dummy variable,  $COMPL_i$  is assigned the value 1 if individual received 240 or more hours of language training.  $Z$  is a vector of exogenous variables (e.g. age at migration, years since migration, post-migration education etc.), and  $\alpha$ 's are unknown parameters to be estimated.  $\nu$  is the error term.

The coefficients obtained from the probit regression in Equation 1 indicate the effect of each variable (regressor) on the probit transformation of the dependent variable,  $LANG.PROF_{ij}$ . They do not lend themselves to a straightforward interpretation as such. However, once transformed, using the mean value of each variable in the calculations, they can provide the impact of each variable on the probability that the dependent variable takes the value one. For continuous variables they indicate the effect, everything else equal, that an increase of one unit in that variable has on the probability of the dependent variable taking the value one.

##### *Instrumental variables*

Given the presumption that the same unobserved heterogeneity that affects an immigrant's decision to participate in the language training programme also affects his language proficiency, the probit model was estimated using an instrumental variable approach. The difficulty with this technique is that viable instruments are not easy to find. If a variable can be found that is sufficiently correlated with language training, but does not directly influence the outcome of the training, i.e., language proficiency, one can use the instrumental variable technique to remove the heterogeneity bias. In this analysis, *unemployment* and other *social benefits* dummy variables were used

as instruments for Language Training Programme. The reason is that such public sector transfers are contingent upon immigrants being active. For example, participating in the Norwegian language training programme etc. Hence, these variables will clearly influence immigrants' decisions to participate in the language training programme but will not directly affect their language proficiency.<sup>6</sup>

*A. Understanding proficiency.* A good understanding of the Norwegian language is important as far as productivity is concerned. It enables one to carry out orders at the workplace. It also reduces communication costs, particularly if immigrants and Norwegians are complements in the production of goods and services. The question of interest here concerns the factors that determine an individual's understanding proficiency in Norwegian?

From the reported  $t$ -statistics in Table 2, it is easy to verify that age at migration, English language literacy and *URDU* language are statistically significant, suggesting that these variables determine immigrants' understanding proficiency in Norwegian language. For example, immigrants who arrived in Norway at age 20 are 18 percentage points less likely to acquire understanding proficiency in Norwegian than those who arrived at age 10. It is interesting to note that English literacy or the ability to read and write English language well or very well, increases the likelihood that an immigrant will acquire understanding proficiency in Norwegian by 8.3 percentage points. Also the effects of having *URDU* as a mother tongue is as expected. Immigrants who speak *URDU* are less likely to acquire proficiency in understanding Norwegian than others. This is consistent with the linguistic distance hypothesis, which posits that the larger the distance between an immigrant's ethnic language and the Norwegian language, the more difficult it is for an immigrant to learn the Norwegian language.<sup>7</sup>

*B. Speaking proficiency.* Speaking proficiency in Norwegian is a verbal communication by which immigrants can transmit information to Norwegians, and probably among themselves. It can also serve as a positive signal to employers about the unmeasured ability of an immigrant. However, immigrants' speaking proficiency will depend on several factors. For example, immigrants who arrived in Norway at age 20 are 19 percentage points less likely to acquire speaking proficiency in Norwegian than those who arrived at age 10. The results show that period of residence as measured by years since migration is an

<sup>6</sup> The procedure used was as follows. The language training dummy was regressed on a set of instruments (i.e., unemployment and social benefits, years since migration, refugee status, Oslo) using a probit model, and included the fitted value from this first stage along with the other variables in the language equation.

<sup>7</sup> Pre-migration schooling was dropped from the analysis, since the native language may be the language of instruction in schools in the individual countries of origin. Therefore, using both measures of native language and pre-migration schooling in the language equation can cause multicollinearity problems.

Table 2. *Probit: parameter estimates of Norwegian language proficiency*

	Fluency				Literacy			
	Understanding proficiency		Speaking proficiency		Reading proficiency		Writing proficiency	
	Coeff	M.E.	Coeff	M.E.	Coeff	M.E.	Coeff	M.E.
Intercept	1.2049 (2.147)*		0.4616 (0.905)		0.0226 (0.042)		0.4012 (0.749)	
Age at migration	-0.0379 (3.706)*	-0.0091	-0.0382 (3.773)*	-0.0095	-0.0333 (3.239)*	-0.0081	-0.0173 (1.723)**	-0.0043
Years since migration	0.0143 (1.099)	0.0034	0.0283 (2.200)*	0.0070	0.0312 (2.335)*	0.0076	0.0090 (0.688)	0.0022
Refugee status	-0.0501 (0.251)	-0.0119	-0.2041 (1.070)	-0.0507	-0.1773 (0.867)	-0.0432	-0.0981 (0.516)	-0.0245
Norwegian wife	0.1267 (0.695)	0.0301	0.1326 (0.774)	0.0330	0.2509 (1.397)	0.0612	-0.1093 (0.639)	-0.0273
English fluency	0.1086 (0.533)	0.0258	0.3347 (1.715)**	0.0832	-0.0851 (0.418)	-0.0208	-0.0339 (0.176)	-0.0085
English literacy	0.3496 (1.729)**	0.0831	0.1555 (0.803)	0.0387	0.8973 (4.379)*	0.2191	0.8548 (4.426)*	0.2136
Post-migration investment								
Post-migration education	0.0337 (0.231)	0.0080	0.1620 (1.159)	0.0403	0.4574 (3.138)*	0.1117	0.4057 (2.906)*	0.1014
Part. lang. tr. prog	0.3972 (1.435)	0.0944	0.5347 (1.963)**	0.1329	0.5141 (1.863)**	0.1255	0.0773 (0.285)	0.0193
Compl. lang. tr. prog	-0.0912 (0.520)	-0.0217	-0.1384 (0.806)	-0.0344	0.1260 (0.719)	0.0308	0.0957 (0.549)	0.0239
Linguistic distance								
Arabic	0.4904 (1.005)	0.1166	0.3513 (0.835)	0.0873	0.2828 (0.629)	0.0690	-0.3897 (0.872)	-0.0973
Spanish	-0.4058 (0.850)	-0.0965	-0.1242 (0.289)	-0.0309	-0.0990 (0.216)	-0.0242	-0.8378 (1.828)**	-0.2093
Urdu	-0.8456 (1.882)**	-0.2010	-0.5240 (1.322)	-0.1303	-0.7500 (1.761)**	-0.1831	-0.7663 (1.778)**	-0.1915
Probability (%)	61.08		53.68		57.63		48.80	
LRI(%)	13.94		12.41		15.83		14.36	
LOGL ( $\beta = 0$ )	-289.63		-305.57		-298.98		-307.47	
LOGL (max)	-249.27		-267.65		-251.64		-263.31	
$\chi^2_{12}$	80.71		75.84		94.67		88.32	
Sample size	444		444		444		444	

Notes: \* *T*-statistics in parentheses, significant at 5%.

\*\* *T*-statistics in parentheses, significant at 5% with one-sided *T*-test.

<sup>1</sup> The marginal effects (M.E.) were calculated at the sample mean.

important determinant of immigrants' speaking proficiency. An immigrant who has been in Norway for a period of 20 years is 14 percentage points more likely to acquire speaking proficiency in Norwegian than someone who has been in the country for 10 years. The positive impact of years since migration on speaking proficiency is expected since it measures the duration of exposure to Norwegian-speaking environment.

As anticipated both by the literature on human capital investment and by the few language studies that account for the effect of language training on immigrants' language proficiency (see e.g. Beenstock, 1996, Gonzalez, 2000), language training ( $t = 1.963$ ) has a significantly

positive effect on immigrants' speaking proficiency, holding other variables constant. For example, participation in the language training programme increases the likelihood of an immigrant acquiring speaking proficiency by 13.3 percentage points, when evaluated at the sample mean.

One other important result to consider is the positive effect of English language fluency on immigrants' speaking proficiency in Norwegian language. The results show that English language fluency increases an immigrant's speaking proficiency in Norwegian by 8.3 percentage points. Both the Norwegian and English languages are derivatives of the Germanic language. For this reason, fluency in English

language makes it easier for an immigrant to acquire fluency in Norwegian language.

*C. Reading proficiency.* Reading proficiency is an important component of Norwegian language literacy. One key variable which clearly plays a role in determining reading proficiency in Norwegian is age at migration ( $t = 3.239$ ). The results show that immigrants who arrived in Norway aged 20 are 16.2 percentage-point less likely to acquire reading proficiency in Norwegian language than those who arrived at age 10. As expected reading proficiency also improves with the period of residence in Norway. For example, extending one's stay in the country by one year improves the likelihood of an immigrant acquiring reading proficiency by 0.7 percentage point, when evaluated at the sample mean. English language literacy ( $t = 4.379$ ) tends to be an added advantage for immigrants acquiring reading proficiency in Norwegian. This raises the likelihood of an immigrant acquiring reading proficiency in Norwegian by 21.9 percentage points.

Immigrants who receive formal education in Norway are 11.2 percentage points more likely to acquire reading proficiency in Norwegian language than those who do not. Also significant is language training. Participation in the language training programme increases the likelihood of an immigrant acquiring reading proficiency in Norwegian by 12.5 percentage points. However, having *URDU* as a mother tongue reduces the likelihood of an immigrant acquiring reading proficiency in Norwegian by 18.3 percentage points.

*D. Writing proficiency.* Apart from speaking proficiency, an immigrant can reveal his proficiency in the Norwegian language to potential employers through writing. Writing proficiency will also enhance an individual's productivity in sectors where good writing skills are required. But unlike the other language skills, age at migration ( $t = 1.723$ ) has a much weaker effect on individual writing proficiency. As the results show, holding other variables constant, those who arrived in Norway at age 20 are 8.6 percentage points less likely to acquire writing proficiency in the Norwegian language than those who arrived at age 10. The years since migration variable has a positive sign but is statistically insignificant. As implied in Dustmann (1997), acquisition of writing proficiency in Norwegian would require a more systematic approach than a simple exposure to the Norwegian environment.

Interestingly, English language literacy is strongly significant ( $t = 4.426$ ), increasing the likelihood of an immigrant acquiring writing proficiency in the Norwegian language by 21.4 percentage points. This is not surprising since both English and Norwegian languages share similar gram-

matical structure and vocabulary (especially technical vocabulary). The results also show that immigrants who invest in formal education in Norway are 10.1 percentage points more likely to acquire writing proficiency in the Norwegian language than those who do not. This is to be expected since it is easier for an immigrant to learn to read and write the Norwegian language efficiently in school rather than outside school.

Having *SPANISH (URDU)* as the mother tongue reduces the likelihood of an immigrant acquiring writing proficiency in Norwegian language by 20.9 percentage (19.2 percentage) points respectively. This is also due to the large distance between these ethnic languages and the Norwegian language.

## V. THE ECONOMIC RETURNS TO NORWEGIAN LANGUAGE PROFICIENCY

The general hypothesis in the migration literature is that since language proficiency is a form of general human capital, it will increase productivity. Given that individuals are paid their value marginal products, returns to investment in language proficiency would be positive. To test this hypothesis, the following earnings function was estimated

$$\text{Ln } EARN_i = \beta'x_i + \varphi \text{LANG.PROF}_{ij} + \varepsilon_i \quad (2)$$

Where  $\text{Ln } EARN$  is the natural logarithm of annual earnings,  $x_i$  represents a series of independent variables (e.g., pre- and postmigration education, work experience, period of arrival, married etc.) assumed to determine immigrant earnings;  $\beta$  is a vector of unknown but estimable parameters, and  $\varepsilon_i$  is a disturbance term assumed to be normally distributed with zero mean and constant variances  $\sigma_\varepsilon^2$ .

The return to Norwegian language proficiency,  $\text{LANG.PROF}_{ij}$  is measured by  $\varphi$ . However, estimating Equation 2 using *OLS* estimator would result in inconsistent parameter estimates due to possible measurement errors, which are inherent in the self-rated competence in language proficiency. The challenge is to find suitable instruments, which are correlated with language proficiency but do not directly affect earnings. In this analysis, *ethnicity of wife* and *mother tongue* (Arabic, Spanish and Urdu) dummy variables were used as instruments for language proficiency in the earnings regression.<sup>8</sup> The logic is that immigrants who have Norwegian wives will face lower costs in acquiring Norwegian language proficiency since their wives would help them (time input, home environment) and provide them with the necessary resources e.g., books etc. However, Norwegian wives do

<sup>8</sup> Note that a similar approach described in footnote 6 was used here.

Table 3. Estimates of earnings function (dependent variable =  $\ln$  annual earnings)

	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	11.299 (27.556)*	11.353 (26.502)*	11.381 (27.273)*	11.386 (27.192)*	11.320 (27.580)*	11.357 (26.428)*
Pre-migration educ	0.0028 (0.357)	0.0032 (0.412)	0.0033 (0.432)	0.0034 (0.434)	0.0027 (0.349)	0.0029 (0.374)
Post-migration educ	0.0519 (0.783)	0.0535 (0.806)	0.0672 (0.989)	0.0637 (0.947)	0.0641 (0.942)	0.0785 (1.126)
Experience	0.0346 (2.457)*	0.0340 (2.396)*	0.0335 (2.373)*	0.0338 (2.400)*	0.0340 (2.412)*	0.0338 (2.390)*
Experience squared	-0.0007 (1.714)**	-0.0007 (1.581)**	-0.0007 (1.695)**	-0.0007 (1.751)**	-0.0007 (1.700)**	-0.0007 (1.721)**
Full time	0.3696 (1.522)**	0.3704 (4.932)*	0.3655 (4.869)*	0.3725 (4.956)*	0.3687 (4.916)*	0.3666 (4.869)*
Married wife present	0.0423 (0.514)	0.0393 (0.477)	0.0493 (0.599)	0.0383 (0.466)	0.0323 (0.388)	0.0444 (0.527)
Children present	-0.0127 (0.183)	-0.0141 (0.203)	-0.0156 (0.224)	-0.0097 (0.139)	-0.0061 (0.088)	-0.0065 (1.606)**
Oslo	0.1855 (1.601)**	0.1849 (1.598)**	0.1984 (1.706)**	0.1769 (1.526)**	0.1832 (1.583)**	0.1893 (1.606)**
Secondary occupation	0.0089 (0.111)	0.0069 (0.089)	0.0067 (0.084)	0.0093 (0.115)	0.0071 (0.087)	0.0099 (0.122)
Language test	0.0879 (1.184)	0.0904 (1.215)	0.0861 (1.162)	0.0933 (1.256)	0.0921 (1.240)	0.0887 (1.188)
Period of immigration <sup>a</sup>						
1988–1992	-0.1910 (1.601)**	-0.2038 (1.581)**	-0.2206 (1.706)**	-0.2154 (1.686)**	-0.2002 (1.590)**	-0.2187 (1.686)**
1981–1987	-0.0922 (1.030)	-0.1004 (1.099)	-0.1182 (1.270)	-0.1080 (1.190)	-0.0982 (1.095)	-0.1161 (1.245)
Country of birth <sup>b</sup>						
Chile	-0.1978 (0.748)	-0.2075 (0.782)	-0.2383 (0.892)	-0.2181 (0.824)	-0.1983 (0.750)	-0.2321 (0.867)
Morocco	-0.3102 (1.244)	-0.3079 (1.236)	-0.3046 (1.224)	-0.3021 (1.213)	-0.2867 (1.142)	-0.2897 (1.154)
Pakistan	-0.3572 (1.446)	-0.3651 (1.476)	-0.3849 (1.553)**	-0.3782 (1.529)**	-0.3323 (1.336)	-0.3698 (1.460)
Understanding proficiency		-0.0342 (0.428)				-0.0409 (0.379)
Speaking proficiency			-0.0752 (0.997)			-0.0638 (0.669)
Reading proficiency				-0.0693 (0.976)		-0.0556 (0.566)
Writing proficiency					-0.0540 (0.794)	-0.0308 (0.392)
Selectivity ( $\hat{\lambda}$ )	0.0856 (0.307)	0.0707 (0.252)	0.0769 (0.276)	0.0780 (0.287)	0.0869 (0.312)	0.1002 (0.536)
R-Squared	0.2317	0.2322	0.2344	0.2342	0.2334	0.2361
$F[k-1, N-k]$	5.01	4.71	4.77	4.77	4.74	4.05
Sample size	283	283	283	283	283	283

Notes: <sup>a</sup> Reference cohort: 1967–1980. <sup>b</sup> Reference group: other.

\*  $T$ -statistics in parentheses, significant at 5%.

\*\*  $T$ -statistics in parentheses, significant at 5% with one-sided  $T$ -test.

not directly affect immigrant earnings. Similarly, due to linguistic distance, mother tongues may influence immigrants' proficiency in Norwegian but not their earnings directly

Column (1) of Table 3 presents the results from the earnings regression without controlling for Norwegian

language proficiency, while columns (2) – (6) have either one or all the dummies measuring proficiencies in understanding, speaking, reading and writing Norwegian language respectively. Almost all of the studies (see, e.g., Dustmann 1994; Chiswick and Miller, 1995; Gonzalez, 2000) reviewed found positive effects of language skills on

immigrant earnings; none are found here. The *t*-tests for the four language dummies do not approach significance.<sup>9</sup> A probable explanation for the insignificant coefficients of the Norwegian language dummy variables is that immigrants acquire Norwegian language proficiency to be able to get into jobs in the Norwegian labour market.<sup>10</sup> However, once they are in employment, their wages are not necessarily determined by their proficiency in Norwegian. The fact that Third World immigrants are usually found in low-skilled and least-paid jobs in the Norwegian labour market (Hayfron, 1998), lends credence to this argument. This finding is also in agreement with previous study by Kossoudji (1988, p. 216). The study by Kossoudji reported that English language ability (ELA) has no significant effect on earnings of immigrants in the USA, and that the role of ELA is both occupationally and ethnically specific.

The return to actual work experience is about 4% in the first year and 2.1% after 10 years, all else being the same. Full time workers earn 36.7% more than part time workers. The results show that earlier waves of immigrants have higher earnings than do more recent waves. It is worth noting that the coefficient of arrival cohort 1988–1992 increases in magnitude as the individual language dummies are entered into the earnings equation. For example, if all the four language dummies are entered into the earnings equation (column 6), the earnings deficit increases from 19.1% to 21.9%. An intuitive argument is that part of the initial earnings deficit experienced by most recent immigrants can be attributed to deficiency in the Norwegian language, which is consistent with the assimilation hypothesis. However, care must be taken when interpreting these results, since the language dummies are not statistically significant. Another perspective on the findings is what they imply for the analysis of immigrants' earnings. These findings indicate that a lack of control for language proficiency will overstate the effect of assimilation on immigrant earnings.

A language test dummy was used to proxy for language-specific occupations in the labour market. Although statistically insignificant, the estimated coefficient of the language test dummy has a plausible sign. Immigrants living in Oslo/Akershus municipality have a higher earnings (18–19%) than do immigrants living in Bergen municipality.

One problem with survey data is that individuals in the sample may not necessarily be randomly selected and this can cause bias in the estimations based on this data. This possibility was investigated using Heckman's (1976) two-

stage estimation procedure and the results indicated that there was no selection bias.

## VI. SUMMARY AND CONCLUSIONS

This paper examines the effect of language training on immigrants' Norwegian language proficiency. It also estimates the economic returns to Norwegian language proficiency. The major findings can be summarized as follows:

1. Of primary policy interest is the effect of a government-sponsored language training programme. Immigrants who participate in the Norwegian language training programme are more likely to acquire speaking and reading proficiencies in the Norwegian language than those who do not.
2. Older immigrants are less likely to acquire proficiency in understanding, speaking, reading and writing the Norwegian language than younger immigrants.
3. The longer an immigrant stays in Norway, the more likely that he will acquire proficiency in speaking and reading Norwegian.
4. Immigrants who have acquired literacy in the English language are also more likely to acquire literacy in the Norwegian language. This is due to the fact that both English and Norwegian languages share similar grammatical structure and vocabulary (especially technical vocabulary).
5. The findings show a larger linguistic distance between mother tongues, particularly Urdu and Spanish, and Norwegian language proficiency, as a mother tongue reduces the probability of an immigrant acquiring Norwegian language proficiency. The mother tongues differ from Norwegian language both in orthography and structure.
6. Contrary to what one would expect, Norwegian language proficiency has no significant impact on immigrant earnings. The suspect assumption is that acquisition of Norwegian language becomes an important signal of ability to employers during hiring of immigrants, but not necessarily in the wage determination.
7. Finally, the analysis shows that earlier waves of immigrants have higher earnings than do more recent waves, and language deficiency partly explains the initial earnings deficit experienced by recent immigrants. This is consistent with the assimilation hypothesis.

<sup>9</sup> An *F* test conducted on the individual language proficiencies, as well as collectively led to the conclusion that the null hypothesis that  $\varphi > 0$ , cannot be accepted at conventional level of significance (1%, 5%). However, the joint test that the language skills together with the other regressors have no significant impact on earnings was rejected at conventional level of significance (1%, 5%).

<sup>10</sup> In this case, language becomes more of a signal and less of a human capital.



As mentioned earlier, the number of Third World immigrants to Norway has increased rapidly in the past few decades, despite the country's restrictive immigration policy. Clearly, gaining an understanding of how acquisition of Norwegian language proficiency leads immigrants to succeed in the Norwegian labour market is a valuable exercise. However, the empirical results are necessarily on weaker ground because the data used to estimate the effects of language training on immigrants' language proficiency and subsequent earnings in the labour market, have some limitations. For example, this study is confined to a select subsample of the immigrant population, such that the results may not easily generalize to the other non-Nordic groups that form the bulk of immigration to Norway.

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