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Language Training, Language Proficiency and Earnings: Lessons from Norway

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Language Training, Language Proficiency and Earnings of Immigrants in Norway[1]

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Abstract

In Norway, the government is directly involved in immigrants' investments in Norwegian language skills both as a provider and subsidizer. This paper assesses the effects of subsidies and language programs on language training choices and evaluates the extent to which language proficiency improves labor market outcomes. The results show that Third World immigrant men who take more than the basic language training (i.e., 240 hours) speak better Norwegian and earn more than those who take fewer hours. A sensitivity analysis shows that the older an immigrant is, the less likely that he will invest in more than the basic level. (100 words)

JEL classification: J31, J61

Key Words: Language Training, Immigrant, Earnings

I. Introduction

The earnings assimilation was first analyzed by Barry Chiswick (1978), and later refined by George Borjas (1985). [2] Chiswick concluded that U.S. immigrants earn less than their native-born counterparts but over time immigrants experience a rapid earnings growth relative to native-born, and after 10-15 years immigrants 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 time and money in post-migration human capital that increases their productivity and earnings over time.

One important element of post-migration human capital is the country's official language.[3] Immigrants need to acquire language skills to be able to obtain relevant information about jobs and earnings, and to communicate their pre-existing skills to potential employers in the labor market. Language also helps immigrants in their jobs. Furthermore, immigrants need the language to socialize or integrate into the "mainstream" of society. Although it has long been recognized that the learning of a host country's dominant language takes time, the form in which the learning process takes place has not been accorded the importance it deserves in the assimilation literature. Do immigrants acquire language capital through formal training (e.g., participating in language training program) or through informal training (e.g., self-study) or both?

[2] For a detailed survey on the comparison between cross-sectional and cohort analyses of earnings assimilation, see Borjas 1994.

[3] Language is considered as an "economic good" or a form of general human capital. Individuals invest in language in the same way as they invest in other forms of human capital, such as education.

In this paper, a Norwegian survey data is used to analyze the formal aspect of language acquisition and how that influences the language fluency and earnings of Third World immigrant men in the Norwegian labor market. The paper focuses specifically on Third World immigrants to Norway for three reasons: First, as Table 1 shows, the number of Third World immigrants has increased rapidly (relative to the total foreign born) over the last decade. Second, most recent immigrants do not have English language as a mother tongue.[4] Apart from the other Scandinavian languages (e.g., Danish and Swedish), the English language seems to be an important medium of communication in Norway. Finally, Third World immigrants account for 15-20% of total unemployment in the country. The major employers in Norway have blamed this on the lack of Norwegian language proficiency (Norsk Gallup 1993).

In Norway, the government is directly involved in immigrants' investments in the language skills both as a provider and subsidizer. For this reason, the paper assesses the effects of subsidies and language programs on language training choices and evaluates the extent to which language proficiency improves labor market outcomes.

☛ Insert Table 1 About Here

The consequences of language skill acquisition for individual labor market outcomes are well established in the labor economics literature (see, e.g., McManus, Gould and Welch 1983; Grenier 1984; McManus 1985; Jasso and Rosenzweig 1987;

[4] Pakistan has English as the national language, but the language most spoken is the native language, Urdu.

Tainer 1988; Kossoudji 1988; Dustmann 1994; Chiswick and Miller 1995; Carliner 1995, Funkhouser 1995). Chiswick and Miller (1995) found that the rate of return to language capital is higher for immigrant men in the United States (17 percent) than for those in Australia (5-8 percent), Canada (12 percent) and Israel (11 percent). Dustmann (1994) extends the study of language fluency to include female immigrants (see also Carliner et. al). He found that male and female immigrants with above average (above intermediate level) speaking fluencies earn 6.9 percent and 7.1 percent more than those with weak fluencies in the German language. Similarly, male and female immigrants with above average (intermediate level) writing fluency in the German language earn 7.3 percent and 15.3 percent more than those with deficiency in the German language.

The quality and economic returns to language skills could be high for some immigrants but low for others due to the nature of language training received. For example, Beenstock (1996) found that immigrants who completed language school in Israel improved their ability to speak Hebrew relative to those who dropped out of language school, while the dropouts also improved their language fluency relative to non-participants.

This paper is organized as follows. Section II presents background information on language training programs in Norway. Section III presents the data and descriptive statistics, while the analyses of the impact of language training on speaking and writing fluencies in Norwegian are presented in Section IV. In section V, the impact of language training on immigrant earnings is studied. Since individuals differ with regard to choice of hours of training, the marginal gain associated with language training choices is calculated. In section VI, a sensitivity analysis is conducted to see

how internal rate of return responds to changes in age. Finally, section VII concludes the analysis.

II. Norwegian Language Training Programs

In the early 1970s, the Norwegian government initiated a policy designed to help immigrants arriving in Norway to overcome their initial language problems. Following the government's policy, language schools were established in the country where foreign residents could receive training in Norwegian language and civics. At the time the language training program was introduced, the majority of immigrants in Norway originated from Denmark, Sweden and other developed countries.[5] Immigrants who enrolled in the language training programs in the early 1970s had to pay tuition fees. However, due to the initial poor attendance, the government decided to encourage large enrollments by providing free tuition for all immigrants (NOU 1973: 17). Recently, the government's policy has made it obligatory for immigrants, particularly political immigrants to participate fully in the language training programs. The public sector transfers to immigrants in the form of unemployment and other social benefits are contingent upon an individual being active, e.g., receiving language training or formal education.[6]

[5] As of 1970, immigrant men from Western Europe constituted 1.5% of the Norwegian population, with Denmark and Sweden contributing 0.8%. About 0.2% originated from the United Kingdom, while 0.3% and 0.1% originated from North America and the Third World respectively (Population and Housing Census, 1980).

[6] In the 1993 national budget, the Norwegian government increased its subsidy for Norwegian language instruction for adult immigrants from NoK.300 to NoK.335 per lesson, while the amount for participation was also raised from NoK.15 to NoK.16 per person. This was to

The number of hours of instruction in Norwegian language and civics offered immigrants depends on, among other things, the individual participant's immigration status (KAD 1993). For instance, immigrants with refugee status, or those who were given residence permits on humanitarian grounds, are eligible for up to 750 hours of Norwegian instruction free of charge, while immigrants with residence or work permits are eligible for only 240 hours.

There may be several reasons why the government spends more resources on refugees' language training than on the other immigrants. First, as a member of the United Nations, Norway has an obligation to provide shelter for a number of refugees that arrive at its borders each year, and language training is one of the resettlement programs.[7] Moreover, since refugees are expected to stay longer in Norway than most economic migrants, their economic successes would depend on their ability to communicate in Norwegian with the general population. Finally, some refugees may be less skilled and would probably need more time than an average immigrant to acquire fluency in the language. On the other hand, skilled refugees would gain more the longer the language training.

Apart from the government-sponsored language training programs that newly arrived immigrants receive prior to entering the Norwegian labor market, some Norwegian firms organize on-the-job language training for their immigrant workers. An agreement between the Norwegian Federation of Trade Unions (LO) and the

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strengthen the efforts of the individual local governments, which organize the language training programs at the local level (St. meld. Nr. 61. 1989-90).

[7] During the 1980s, Norway's intake of refugees from the United Nations High Commission for Refugees was about 1000 per year (Report 90/8). The number of refugees admitted into the country increased from 1000 to 1683 per year, bringing the total number of UN-sponsored refugees to 5050 between 1992 and 1994 (Mosaikk nr. 2, 1994).

Norwegian Employers' Confederation (NH) in 1978, allows immigrant workers to take some time off (two hours a week) from work to attend Norwegian language classes without a loss of pay.[8] This economic incentive and other effects of language training programs provide the basic motivation for much of the analysis in this paper.

III. Data and Descriptive Statistics

For the purpose of this study, a survey was conducted in 1993 to collect information on the Norwegian Language Proficiency of Third World immigrant men in Norway. The sample includes 452 men aged 17-65 originating from Morocco, Pakistan and Chile living in Norway's two largest municipalities, Oslo and Bergen.[9] Although, this survey data has a small sample size, it is preferred to the Population and Housing Census data, since the survey has additional information of vital importance in the study of language assimilation, and are not available in the census and other data in Norway. Apart from the language-specific variables such as Norwegian, English and mother tongue, the data has information on age and year of arrival in Norway, actual work experience and language proficiency test.

In the survey, individuals were asked the following questions. Currently, how do you assess your Norwegian language fluency? Would you say: I understand Norwegian; I speak Norwegian; I read Norwegian; and I write Norwegian.

[8] In Sweden, immigrants can take 240 hours off work to attend language school without loss of pay. Time off and pay are reduced proportionately for workers in part-time employment (e.g., Boye-Møller 1973).

[9] This represents a response rate of 22.6% of the questionnaires sent out.

Respondents were to answer each of these questions on a scale with four levels: "Very well", "Well", "Average" or "Poor" respectively.

The respondents were also asked to indicate whether they had received language training, and if yes, to indicate the number of hours of language tuition received. About 80 percent of the immigrants in the sample reported that they had received language training. For the purpose of this analysis, the hours of language training were decomposed into three relatively broad levels. These are: (1) Less than 240 hours; (2) 240 hours which is the minimum required level of language training, and (3) Greater than 240 hours. The three-way categorization is dictated by the need to have a sufficient number of observations in the relevant groups. Following the argument in Greene *et al.* (1994, p244), that 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, the missing observations in the data were replaced with the mean value for the full sample (See, also Griliches 1986).

☛ Insert Table 2 About Here

Descriptive Statistics

Table 2 presents descriptive statistics and variable definitions. The average age at migration for Third world immigrant men is 24 years. Similarly, an average immigrant has lived in Norway for a period of 9 years. About 78 percent of immigrants have received an average of 294 hours of language training, which is above the minimum required 240 hours. About 18.2 percent of immigrants in the sample reported that they

have taken Norwegian language proficiency test prior to being employed, and 24.6 percent have spouses who are native-born Norwegians. On the whole, 80 percent of the respondents have children present in Norway.

☛ Insert Table 3 About Here

Table 3 provides some stylized facts regarding the relationship between hours of language training, period of residence in Norway, age at migration and language fluency. The figures in the first panel of Table 3 indicate that for immigrants who have been in Norway for a period of 5 years or less, more hours of language training are associated with greater ability to speak Norwegian very well. A chi-square test of the null hypothesis of no association between language training and speaking fluency was rejected at 5 percent significance level.

For those with more than 5 years, the data show a weak relationship between language training and speaking ability. This may be due to the fact that period of residence in itself may be a good determinant of an individual's ability to speak fluent Norwegian. The figures in the second panel provide a similar picture, although the chi-square test failed to reject the null hypothesis of no association between hours of language training and writing skills. The data tend to suggest that the longer the period of residence in Norway the better the effect of language training on an immigrant's ability to write fluent Norwegian.

Additional information about the relationship between language training and language fluency can be obtained by controlling for age at time of arrival in Norway. As Table 4 shows, the older the immigrant at time of arrival, the less extensive the shift to

Norwegian language fluency. This applies to both speaking and writing abilities. In summary, language training has a positive effect on an individual's language fluency, given age at migration and period of residence in Norway.

☛ Insert Table 4 About Here

IV. Language Training and Language Fluency

Although the descriptive data presented in the previous section indicate that immigrants who invest more hours in language training speak and write better Norwegian than those who invest fewer hours, they do not provide all the information necessary to infer how language training affects individual's ability to speak and write fluent Norwegian. It is therefore important to conduct a more formal analysis of the determinants of language fluency.

This section discusses regression estimates of the effect of language training on immigrants' speaking (*s*) and writing (*w*) fluencies that control for period of residence, age at migration and other socioeconomic characteristics. The training effects are estimated using the following ordered logit model

$$\ell_{i,s,w} = \alpha + \alpha_1 LTr + \alpha_2 X + \nu, \qquad (1)$$

where ℓ is the level of language fluency, and it is assigned the value 0 if individual *i* reported poor or average fluency, 1 if well and 2 if very well. The variable LTr

represents hours of language training, X is a vector of exogenous variables and $\alpha's$ are unknown parameters to be estimated. v is the error term. Equation (1) is used first to analyze the relationship between language training and speaking fluency and later between language training and writing fluency.

A. Speaking fluency

Table 5, column (1) reports the estimates of the specification for speaking fluency in equation (1). The dependent variable is the individual's self-assessed ability to speak fluent Norwegian.[10] Given the presumption that the same unobserved heterogeneity that affects an individual's decision to participate in language training programs also affects his language fluency, the logistic equation was estimated by instrumental variables technique. The language training dummy (Nltp) was used to generate instrumental variables estimates that identify the relationship between hours of language training (LTr) and language fluency.[11]

[10] One criticism against the use of subjective (i.e., self-reporting) 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 fluency level, since an immigrant is likely to judge his ability relative to a fellow immigrant, and not in comparison with a native-born Norwegian.

[11] The model was estimated in two stages. In the first stage, the hours of language training variable (LTr) was regressed on language training dummy (Nltp) and a set of exogenous variables assumed to determine the intensity of language training. The set of *predicted* values obtained from the first regression was used as instruments for the hours of language training variable $(L\hat{T}r)$ in the second stage, where the dependent variable is an individual's ability to speak Norwegian. Furthermore, the exogeneity of the language training variable (LTr) was tested using a simplified version of the Hausman specification test. The null hypothesis that LTr is exogenous was rejected at 5 percent level of confidence (t = 0.131). Hence, the assumption that language training variable is endogenous was maintained.

As with other nonlinear models, it is difficult to interpret ordered logit parameters since the marginal effect of any particular independent variable on the object (here the probability of falling in a particular cell) will depend on the value of all other independent variables. Therefore, the marginal effects of the variables that attain statistical significance are reported. For example, 0.0311 for years since migration (ysm) in column one of Table 5 may be interpreted as follows; as an immigrant's residence in Norway increases, his speaking fluency shifts from "poor" to "very well" by 3.1 percentage points, evaluated at the sample mean $(\overline{ysm} = 9.7)$. The positive impact of years since migration (ysm) on speaking fluency is expected since it measures the duration of exposure to Norwegian-speaking environment.

Since the main aim is to determine whether language training affects an immigrant's ability to speak fluent Norwegian, I can move directly to consider the coefficients for language training variable (LTr) in column one of Table 5. 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 acquisition (see, e.g., Beenstock et al. 1996), language training has a significantly positive effect on immigrants' language fluency, holding other variables constant. For example, additional hours of language training shift an immigrant's speaking fluency from "poor" to "very well" by 8.8 percentage points, when evaluated at the sample mean.

Having analyzed the effect of language training, attention can now be turned on the marginal effects of other related variables. The anticipated relationships between these variables and speaking fluency are strongly supported in nearly each of these variables. For example, having a Norwegian partner (Norwife) also shifts an

immigrant‘s ability to speak fluent Norwegian from "poor" to "very well" by 0.08 percentage points.[12] This is not surprising, since having a Norwegian partner increases the propensity to use Norwegian language on a regular basis at home. However, how frequent Norwegian is used at home (intensity of exposure per unit of time) would depend on whether or not the partner is bilingual. For example, if the Norwegian partner is proficient in an international language such as English, the incentives to acquire fluency in Norwegian would be reduced in the short run. However, the other language becomes less substitutable for Norwegian as time progresses.

The age at migration variable (Ageentry) measures the effect of aging on an immigrant's acquisition of Norwegian language skills. Generally, immigrant children are likely to learn Norwegian more easily than do adults. This is because immigrant children develop acquaintances with peer groups who are monolingual *i.e.,* who speak only Norwegian. Moreover, through regular contacts with their Norwegian peers on the playgrounds, in the neighborhood and at school, immigrant children would be able to mimic the way these peers express themselves in Norwegian and develop a similar accent. The reverse may be the case for older immigrants. This relationship is shown by the negative coefficient of the variable (Ageentry). For example, those arriving in Norway at age 20 are 7.8 percentage points less likely to speak fluent Norwegian than those arriving at age 10. This is consistent with the findings in other studies (see e.g., Grenier and Vaillancourt 1983; Veltman 1988; Chiswick and Miller 1995; Dustmann 1995; Carliner 1995).

One other important result to consider is the positive effect of English language fluency on immigrants’ ability to acquire fluency in Norwegian. The result indicates

[12] Norwegian partner refers to wife or common-law partner.

that English language fluency shifts an immigrant's speaking fluency in Norwegian from "poor" to "very well" by 4.1 percentage points. This may be true for two reasons. First, both the Norwegian and English languages are derivatives of the Germanic language.[13] In view of this, fluency in English makes it easier for an immigrant to acquire speaking fluency in Norwegian. Second, originating from a non-English speaking country, a knowledge of English reflects an immigrant's flair for languages, which facilitates the learning of a third language, e.g., Norwegian. The interpretation of the coefficients of ethnic language dummy variables is deferred to another section for reasons that will become clear shortly.

B. Writing Fluency

Language training influences not only an immigrant's ability to speak, but also the ability to write fluent Norwegian. For this reason, this section examines the effect of language training on immigrants' ability to write fluent Norwegian. Column 3 of Table 5 presents the estimated coefficients for the ordered logit model, where the dependent variable is the individual's self-assessed ability to write fluent Norwegian. The calculated marginal effects in column 4 of Table 5 can be interpreted as a shift of writing fluency from "poor" to "very well" due to a change in an independent variable.

The results show that Norwegian schooling (EducA) shifts an immigrant's fluency in written Norwegian from "poor" to "very well" by 1.0 percentage point. This is to be expected since it is easier for an immigrant to learn to read and write Norwegian

[13] The Indo-European Germanic languages include Icelandic, Faeroese, Norwegian, Swedish,

efficiently in school rather than outside school. Pre-migration schooling (EducB) was dropped from the analysis, since the native languages may be the languages of instruction in schools in the individual countries of origin. Therefore, using both measures of native language and pre-migration schooling in the logistic regression can cause multicollinearity problems.

As expected, age at time of arrival (Ageentry) in Norway is inversely related to acquisition of writing fluency. For example, those arriving in Norway at age 20 are 38 percentage points less likely to acquire writing fluency in Norwegian language than those arriving at age 10. The years since migration variable (ysm) is positive but statistically insignificant. As implied in Dustmann (1997), acquisition of writing fluency in Norwegian would require a more systematic approach than a simple exposure to the Norwegian environment. The marginal effect of English language dummy (Ela) is positive and significantly different from zero, implying that English language fluency shifts immigrants' fluency in written Norwegian from "poor" to "very well" by 2.4 percentage points. As mentioned earlier, both the English and Norwegian languages share similar grammatical structure and vocabulary (especially technical vocabulary).

C. The Effects of Ethnic Languages on the Acquisition of Norwegian Language Fluency

In this section, I examine the relationship between ethnic languages and immigrants' acquisition of Norwegian language fluency. The aim is to test the linguistic distance

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Danish, German, Yiddish, low German, Dutch, Afrikaans, Flemish, Frisian and English. See, e.g., Merriam-Webster's Collegiate Dictionary, Tenth Edition.

hypothesis, which is prevalent in the literature on language acquisition (see e.g., Chiswick and Miller 1995; Carliner 1995). According to this hypothesis, the greater the differences between an immigrant's ethnic language and the destination language, the greater the difficulty in acquiring fluency in the destination language. Immigrants in the sample originated from Chile, Morocco and Pakistan, where the languages spoken – Spanish, French and Urdu, are different from Norwegian language. For example, both the Spanish and French languages belong to the Italic group, while Urdu belongs to the Indo-Iranian group. These languages differ from Norwegian both in orthography and structure. In this regard, these ethnic languages would have negative effects on immigrants' acquisition of fluency in Norwegian.

The estimation results in Table 6 support this hypothesis. All the ethnic languages except for French have significantly negative coefficients. This implies that Spanish-speaking and Urdu-speaking immigrants will have difficulty acquiring fluency in Norwegian relative to the base group, i.e., other languages. The base group includes individuals who reported Norwegian as the principal language. However, the number of individuals in this group is very small, and inferences regarding their fluency in Norwegian may be unreliable. A probable explanation for the insignificant coefficient of the French dummy, may be due to the opposing effects of bilingualism and linguistic distance. For example, Moroccans have French as an acquired language but they also speak Arabic. Being bilingual should, under normal circumstances, make it easier for Moroccan immigrants to acquire fluency in Norwegian. However, neither French nor Arabic is close to Norwegian, and thus this will also make it more difficult for them to learn Norwegian. Moreover, literacy (i.e. the ability to read and write the ethnic language) may also play an important role in facilitating the acquisition of Norwegian

language fluency. The difficulty in learning Norwegian would be more pronounced for illiterate immigrants than for their literate counterparts.[14]

V. Language Training and Earnings

The analyses in the previous section suggest that language training has a significantly positive effect on immigrants' speaking fluency. Since speaking fluency is required to function in the Norwegian labor market, one can therefore expect language training to affect individual performances on the job and, therefore, earnings prospects. To determine the effect of language training on immigrants' earnings, the following equation was estimated

$$\ell nEarn = \beta' x_i + \varphi Nltp_i + \varepsilon_i . \qquad (2)$$

Where $\ell nEarn$ is the natural logarithm of annual earnings, X represents a series of independent variables (e.g., education, experience, ysm etc.) assumed to affect earnings; β is a vector of unknown but estimable parameters, and ε_i is a disturbance term assumed to be normally distributed with zero mean and constant variances σ_ε^2.

The key variable in (2) is Nltp, which is set to one if an individual has participated in the Norwegian language training programs; zero otherwise. However,

[14] Although the survey data lack a measure of literacy, there exists evidence in the literature of a positive relationship between literacy and language skill acquisition. For instance, Dustmann (1994) found that literacy, as measured by an immigrant's ability to write in the home country's language, increases the probability of being fluent in German.

estimating (2) using OLS estimator would result in inconsistent parameter estimates due to endogeneity problem. For example, an immigrant's decision on whether or not to participate in language training programs is based on a comparison of the costs involved and the expected returns to language training. Since the returns to language training are defined in terms of earnings, the error term of the language training variable would be correlated with the error term of earnings. To address this joint endogeneity of language training and earnings, a *Treatment effects* model was estimated, where the wage effect of language training is measured for workers only, with the participation effect, measured for both workers and non-workers. The instruments used in the primary equation include hours of language training (*LTr*), and a set of exogenous variables.

Table 7 presents the results for both the OLS estimation and the instrumental variables approach (IV) respectively. The dependent variable is the natural logarithm of earnings. The coefficient of the language training dummy (Nltp) has the expected positive sign in both methods, but is statistically significant at the margin (t = 1.872) in the IV method. The results show that immigrants who participate in language training programs earn 24.4 percent more than those who do not, holding other variables constant. A Hausman specification test where the null hypothesis is that the language training dummy, Nltp is exogenous was rejected by the data at 5 percent level of significance.

The other variables have the expected sign in both the OLS and instrumental variables estimators. The magnitudes of the coefficients are almost the same in both estimation methods. However, there are more significant coefficients at conventional

level (5 percent, 1 percent) in the IV estimation than in OLS. For example, the return to actual work experience is 4 percent in the first year and 2.4 percent after 10 years, all else being the same. The results also suggest that the effect of experience peaks after 24.69 years in the labor market. This is consistent with human capital theory, which holds that earnings rise with experience at a diminishing rate. Both the pre-migration and post-migration education variables were dropped from the earnings equation because they have *t* ratios that are less than 0.5.

The period of residence in Norway, as measured by years since migration (ysm) is clearly an important determinant of immigrants' earnings. For example, the relationship between period of residence and earnings is familiar and well established (e.g., Chiswick 1978; Borjas *et al.* 1994; Hayfron 1998). The coefficient of the years since migration variable (ysm) is positive and statistically significant, indicating that an immigrant's earnings increase by 1.2 percent with an extra year of residence in Norway. Furthermore, immigrants who work full time earn 35.3 percent more than those who work part time, all else being the same.

Since language training may be valuable in some occupations but not in others, returns to language investment may also differ across occupations. To capture this effect, a dummy variable (Ntest) which is set to one if an individual has taken a Norwegian language proficiency test prior to being employed, zero otherwise, was used to proxy for language-specific occupations in the labor market. This variable can also be considered as a measure of an individual's ability to speak and write fluent Norwegian language, since the language proficiency test normally involves speaking and writing Norwegian. As expected, the coefficient of the variable (Ntest) is positive and significantly different from zero, implying that immigrants who took Norwegian

language proficiency test prior to being employed receive earnings 12.5 percent higher than those who did not. Furthermore, immigrants holding supervisory positions (Foreman) at the place of work receive earnings 8.7 percent more than those without any leadership position.

*The Potential Gains From Language Train*ing

This section concludes the analysis of earnings determination by examining the potential gains associated with a shift from basic language training to more than 240 hours. Before analyzing the marginal gains, it is perhaps instructive to first examine who is likely to complete the 240 hours of basic language training and who is likely to invest in more than 240 hours, given the personal and labor market characteristics. Those who drop out of the language training program are used as the reference group.

Table 8 reports the estimates from a multinomial logit model (see, appendix A). The results indicate that human capital characteristics, such as Norwegian schooling (EducA), Norwegian labor market training programs (Lmtp), English language ability (Ela) and marital status (Mar) determine which of the language training categories an individual is likely to choose relative to dropping out of the program. For example, the significantly positive coefficient of the variable (EducA), indicates that Norwegian schooling makes it less likely for an immigrant to drop out of language training program. On the other hand, immigrants who participate in labor market training programs are more likely to complete the basic language training than those who do not. The positive estimated coefficient of the variable (Lmtp) is not surprising, since Norwegian is the language of instruction used in the labor market training programs.

Furthermore, immigrants who do not get jobs immediately after undergoing language training will have to register as unemployed, which qualifies them to participate in the labor market training programs. English language ability and marital status make it more likely for an immigrant to complete the basic language training. The negative coefficient of the language training dummy (Nltp), implies that immigrants who participate in the language training programs are more likely to complete 240 hours relative to the base, i.e., dropout.

Table 9 presents estimation results from the earnings equation (see, appendix A). Most of the variables display the expected sign, but only a few have coefficients that are more than twice their estimated standard errors. For example, an individual who has completed the basic language training and is a supervisor in full-time employment earn more on average than an ordinary worker with a part-time job. For those with more than 240 hours of language training, experience, full-time work and language proficiency tend to be important determinants of their earnings.

Finally, Table A1 presents the results from the calculations of the potential gains associated with a shift from 240 hours to more than 240 hours of language training. As an illustration, consider an individual deciding between taking only 240 hours of basic language training, and taking more than 240 hours. Should this individual complete the basic level, his expected annual earnings would be Norwegian kroner (NoK) 114,145. However, if this individual decides to invest in more than 240 hours of language training, his expected earnings would be NoK. 125,158. Clearly, there is a marginal gain associated with investment in more than 240 hours. The marginal gain associated with a shift from 240 hours to more than 240 hours of language training will be the difference between the two earnings levels, i.e., NoK. 11,013. This marginal gain

represents a rate of return of 9.6 percent, without taking into account other training costs (pecuniary and non-pecuniary).

To calculate the present value of the marginal gain, assume that the average age of individuals who complete the basic level of language training is 32 years. Thus, given the retirement age of 65 years in Norway, an average person in the 240 hours group can work for 33 years after undergoing language training, and his yearly earnings go up by NoK. 11,013. Using an interest rate of 10 percent, the present value of the potential gain associated with a shift from 240 to more than 240 hours of language training would be NoK. 115,927.[15] Similarly, the calculated internal rate of return would be 9.11 percent, which is close to the rate of return of 9.6 percent. For details regarding these calculations, see appendix B.

VI. *Sensitivity Analysis*

As noted in section II, Norwegian language training is offered to all immigrants in the Norway regardless of age. For economic immigrants, only the basic 240 hours of language training is free. In this case, the individual must pay for any additional hours of training received. Certain jobs or professions (e.g., nurses, doctors, teachers etc.) may require immigrant workers who have taken for example, 500 hours of Norwegian language training. Therefore, individual immigrants will, depending on their characteristics and intended occupations, decide whether or not to take extra lessons in Norwegian. The present value and the internal rate of return are two common methods

[15] The net aggregate value was not calculated since the data lack information on the gross private and public costs on Norwegian language training.

that are used to assess the profitability of human capital investments including language training.

In this analysis, both the present value and the internal rate of return are calculated. Several assumptions were made to simplify the calculation of the internal rate of return associated with a shift from 240 hours to more than 240 hours of language training. For example, the mean earnings of individuals who have completed 240 hours of language training was used as a proxy for the direct cost of language training. This is the amount an average immigrant will earn if the individual works after receiving only 240 hours of language training. It follows that immigrants who decide to take extra language lessons beyond 240 hours will forgo this earnings. Therefore, I argue that the mean earnings for the 240 hours group can be considered the opportunity cost for those who go from 240 hours to say 500 hours of language training.

Further, I also assume that individuals complete their basic language training at 32 years of age. Subtracting this from the retirement age of 65 years implies that individuals on average will work for 33 years after receiving their basic language training. However, It is also possible that younger immigrants will go beyond the 240 hours than older immigrants. This is because younger immigrants have a longer working life to recoup their costs.

To verify this assumption, I examined the sensitivity of the calculated IRR to age. The internal rate of return for immigrants aged 17, 32 and 50 respectively are reported in Table A1. In each matrix the upper bound is denoted by “high” while the lower bound is denoted by “low”. The upper and lower bounds were calculated using predicted earnings *plus* or *minus* the standard errors of the regressions for the two language training groups respectively. Matrix II is used as a basis of comparison in this

analysis. As can be seen, matrices I and II, look similar both in terms of their signs and orders of magnitude in each matrix. Furthermore, the internal rate of return decreases monotonically as age increases from 17 to 50 years.

To simplify the analysis, consider the first cell of each of the three matrixes. These cells contain internal rates of return that are calculated using high benefits and high costs for each age group. For example, for a 32-year old immigrant, the internal rate of return is 8.9%. However, this figure decreases (increases) as the age increases (decreases). For example, the internal rate of return is highest (9.3%) for a 17-year old and lowest (4.7%) for a 50-year old. Unlike the other age groups, the opportunities for a 50-year old immigrant to invest in more than 240 hours of language training are limited. Thus the projections which reflect low marginal gain and high costs, and low marginal gain and low costs yield negative returns. The fact that internal rate of return declines with age in this analysis can be explained within the context of human capital theory. The older an immigrant is the less profitable for him to invest in more than the basic 240 hours of language training. A similar comparison can be made for the other cells of the matrices across the age groups.

☛ Insert Figure 1 About Here

The relationship between internal rate of return and age is graphed in figure 1. As can be seen, the internal rate of return curves are concave and are declining in age, implying that the profitability derived from more than 240 hours of language training declines with age. Note that both investments with low cost and high benefits (LH) and investment with high cost and high benefit (HH) yield positive returns. Yet, the internal

rate of return is higher for immigrants aged 17 than those aged 50. Even in the cases that yield both positive and negative returns i.e., high cost/low benefit (HL) and low cost/low benefit (LL), older immigrants are worse-off moving from 240 hours to more than 240 hours than the younger immigrants. The overall conclusions are that investment in greater than 240 hours of language training is more likely the higher the returns and the lower the costs of investment. Moreover, the older the individual is at the time of arrival in Norway, the less likely that an individual will invest in more than the basic level i.e., 240 hours of language training.

VII. Summary and Conclusions

This paper uses a survey data to analyze the effect of language training on language fluency and earnings of Third World immigrant men in Norway. The data has information on the number of hours enrolled in language programs, and proficiency in several aspects of language capacity. The paper presented estimates of language fluency (speaking and writing) equations, earnings equations and equation that explains the intensity of Norwegian language program attendance. Several interesting findings emerged from this study some of which are consistent with equivalent North American and European studies, and others of which differ from the previous studies. The major findings are:

First, subsidized language training programs have a significantly positive effect on immigrants' ability to speak fluent Norwegian. This is the case even after controlling for age at time of immigration and period of residence in Norway.

Second, individuals who migrated to Norway as adults are less likely to speak and write fluent Norwegian than those who migrated as children.

Third, the results also imply that language training is most rewarding in firms, which require strong communicative skills.

Fourth, English language fluency plays an important role in explaining the Norwegian language skills of immigrants. This is due to the closeness between the two languages. On the contrary, Spanish and Urdu languages tend to have adverse effects on immigrants' Norwegian language acquisition. These results are consistent with linguistic distance hypothesis, which suggests that the greater the differences between an immigrant's ethnic language and Norwegian language, the greater the difficulty in acquiring fluency in Norwegian.

Finally, participants in language training programs earn 24.4 percent more than non-participants. Among participants, those who invest in more than 240 hours of basic language training receive obtain an increase in yearly earnings by NoK 11,013, a rate of return of 9.6 percent. Furthermore, the present value of the potential gain is estimated at NoK. 115,927 per person, evaluated at 10 percent interest rate over 33 years. The internal rate of return is 9.11%. The sensitivity analysis conducted indicates that the profitability derived from more than 240 hours of Norwegian language training declines with age.

As mentioned earlier, the number of Third World immigrants to Norway is increasing over time, despite the country's restrictive immigration policy. Clearly, gaining an understanding of how language training leads Third World immigrants to succeed in the Norwegian labor market is a valuable exercise. However, the empirical results are necessarily on weaker ground because the data used to capture the effects of

language training on immigrants' ability to communicate with the general Norwegian population and subsequent earnings in the labor market, have some limitations. For example, this study is confined to a select sub-sample 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.

Furthermore, there is also the possibility of self-selection bias due to the small sample size used for this study. For instance, if immigrants who responded favorably to the survey questionnaire are those with higher abilities, then the positive correlation between language training and language fluency, and between language training and earnings may not necessarily be indicative of a causal relationship. However, the statistical methods used to address these problems allow for some confidence in both the estimation results, and the conclusions of this study.

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Appendix A

To examine both the determinants of individual choices of hours of language training and earnings, the Multinomial-OLS-Two stage estimator suggested by Lee (1983) was used. The joint functions of hours of language training and earnings can be specified as

$$P(\varepsilon_\ell < \gamma Z_\ell) = P(y = \ell) = \frac{\exp(\gamma Z_\ell)}{\sum_j \exp(\gamma Z_j)}. \quad (1)$$

$$\ln Y_{i\ell} = \beta_\ell' x_{i\ell} + \Omega_\ell \lambda_\ell + u_{i\ell} \quad (2)$$

where ℓ is chosen level of language training. *x* and *Z* are exogenous variables and β_ℓ, γ corresponding parameters to be estimated. $u_{i\ell}$ is a stochastic term. Estimation of selection function (1) with Multinomial logit produces necessary estimates for the calculation of second term in (2). Given that the individual selections into levels of language training are not random, the selection correction term $\hat{\lambda} = \phi\lfloor J_\ell(\gamma Z)\rfloor / F_\ell(\gamma Z)$ was added to the earnings equation (2) and estimated by OLS. The OLS estimator gives unbiased coefficients for β_ℓ. The earnings equation is corrected using the heteroskedasticity-consistent estimator suggested by White (1980).

Appendix B

Calculating Marginal Gain from Norwegian Language Training

To calculate the marginal gain, and the internal rate of return associated with a shift from 240 to greater than 240 hours of language training, a method similar to the one in McManus (1985) was used. (1) I calculated the mean age for individuals who have

completed the basic language training (i.e., 240 hours). (2) I also calculated the number of years an individual will work after undergoing basic language training by subtracting the *mean age* from the *retirement age*. For example, an immigrant who completes the 240 hours of language training is expected to work 33 (= 65-32) years before retirement. I then used 10 percent interest rate to discount the marginal gain.

☛ Table A1 about here

Several assumptions were made to simplify the calculation of the internal rate of return. For example, average earnings of individuals in the 240-hour group was used as a proxy for the actual cost of investment. Note that the average earnings used represent the earning an individual will forgo by investing in greater than 240 hours of language training. Using this opportunity cost, and the marginal gain associated with the shift from 240 to greater than 240 hours of language training, the internal rate of return was calculated. The results are reported in Table A1.

Table 1

Foreign-born Population in Norway

	1975	1984	1989	1993
Foreign-born population	61,806	97,403	135,948	154,012
% of Norway's population	1.5	2.2	3.2	3.6
Third World immigrants	6,686	24,761	48,848	63,198
% of total foreign-born population	11	25	36	41

Source: Mosaikk no 2, May 1994

TableA1

Calculating the Potential Gains From Norwegian Language Training

	Shift from 240 Hours To > 240 Hours
Age of Retirement (years)	65
Mean age (years)	32
Age of Retirement *minus* Mean age	33
Interest Rate (%)	10
Internal Rate of Return (IRR)	9.11
Calculated Marginal Gain	Nkr 11,013
Present Value of Marginal Gain per person	Nkr 115,927

Table A2. Sensitivity Analysis: The Internal Rate of Return (%).

Age = 17 Years

I

		Opportunity Cost: High	Opportunity Cost: Low
Marginal Gain	High	9.3	24.0
	Low	-2.0	1.8

Age = 32 Years

II

		Opportunity Cost: High	Opportunity Cost: Low
Marginal Gain	High	8.9	24.0
	Low	-4.6	0.2

Age = 50 Years

III

		Opportunity Cost: High	Opportunity Cost: Low
Marginal Gain	High	4.7	22.9
	Low	-16.2	-8.3

Table 2

Description of Variables and Sample Characteristics

	Mean	S.D.	Description
EducB	11.39	3.96	Pre-migration Years of education
EducA	.459	.499	One if received education in Norway; zero otherwise
Exper	12.38	8.57	Reported years of accumulated work experience
Expersq	226.45	290.50	Experience Squared
Ysm	9.73	6.33	Years since migration
Mar	.770	.420	One if married; zero otherwise
Childp	.800	.400	One if children live in Norway; zero otherwise
Ageentry	24.38	8.00	Age at time of immigration
LTr	293.70	102.18	Hours of Norwegian Language Training
Nltp	.787	.410	One if received Norwegian Language training; zero otherwise
Ftime	.768	.423	One if worked full time; zero otherwise
Oslo	.865	.342	One if resident of Oslo; zero otherwise
Ntest	.182	.387	One if taken Norwegian language proficiency test prior to being employed; zero otherwise
Ojt	.319	.466	One if received on-the-job training; zero otherwise
Lmtp	.333	.472	One if received labor market training, zero otherwise
Norwife	.246	.431	One if wife or spouse is Norwegian; zero otherwise
Ela	.419	.494	One if fluent in English Language; zero otherwise
Foreman	.447	.498	One if foreman at workplace; zero otherwise
Refugee	.066	.249	One if immigrated as a refugee; zero otherwise
Country of birth			
Chile	.258	.438	One if originated from Chile; zero otherwise
Morocco	.192	.395	One if originated from Morocco; zero otherwise
Pakistan	.500	.500	One if originated from Pakistan; zero otherwise
Other			Reference
Mother-tongue			
Spanish	.253	.435	One if Spanish is the mother-tongue; zero otherwise
French	.197	.398	One if French is the mother-tongue; zero otherwise
Urdu	.519	.500	One if Urdu is the mother-tongue; zero otherwise
Other			Reference

Table 3

Participation in Language Training Program by Language Fluencies. Percent

Period of Residence (YSM)		<240Hrs	240Hrs	>240Hrs	N
0-5 years	Speaking Fluency				
	Very well	23.5	23.5	52.9	17
	Well	29.9	44.8	25.4	67
	Poor	12.5	50.0	37.5	56
6-10 years	Very well	9.5	28.6	61.9	21
	Well	22.7	46.7	30.7	75
	Poor	23.8	35.0	41.3	80
11-26 years	Very well	9.1	9.1	19.9	33
	Well	22.6	18.9	22.8	53
	Poor	22.0	24.0	19.9	50
0-5 years	Writing Fluency				
	Very well	20.0	33.3	46.7	15
	Well	21.4	51.8	26.8	56
	Poor	23.2	40.6	36.2	69
6-10 years	Very well	21.1	21.1	57.9	19
	Well	16.7	51.9	31.5	54
	Poor	24.3	35.9	39.8	103
11-26 years	Very well	15.4	7.7	76.9	26
	Well	14.6	25.0	60.4	48
	Poor	24.2	17.7	58.1	62

Table 4

Age at Migration by Language Fluency. Percent

	Speaking Fluency			
	Very Well	Well	Poor	N
Age at migration (Years)				
0-5	100	0	0	7
6-10	62.5	6.3	31.3	16
11-16	34.0	27.7	38.3	47
17-30	11.9	50.0	37.7	302
> 30	2.5	36.3	61.3	80
		Writing Fluency		
0-5	71.4	28.6	0	7
6-10	50.0	18.8	31.3	16
11-16	27.7	29.8	42.6	47
17-30	10.3	38.7	51.0	302
> 30	3.8	27.5	68.8	80

Table 5

Ordered Logit: Parameter Estimates of Norwegian Language Fluency

	Speaking Fluency		Writing Fluency	
	Coefficients	Marginal Effects	Coefficients	Marginal Effects
Intercept	1.4868 (1.424)		1.0036 (0.918)	
Lang Train	.0045 (2.130)[a]	.0881	.0004 (0.201)	
EducA	.0585 (0.280)		.5330 (2.419)[a]	.0101
Ysm	.0519 (2.915)[a]	.0311	.0276 (1.433)	
Ageentry	-.0640 (4.288)[a]	-.0951	-.0403 (2.745)[a]	-.4632
Mar	-.3342 (1.313)		-.1535 (0.606)	
Norwife	.4423 (1.626)[b]	.0008	-.0754 (0.266)	
Childp	-.1910 (0.761)		.0590 (0.227)	
Oslo	-.3087 (0.839)		.0336 (0.092)	
Lmtp	.2496 (1.232)		.2144 (1.007)	
Refugee Status	-.0747 (0.323)		-.1327 (0.552)	
Ela	.3952 (1.892)[b]	.0240	.8429 (3.992)[a]	.0410
Native Language				
Spanish	-1.2973 (2.057)[a]	-.0130	-1.3770(2.060)[a]	-.0084
French	-.1994 (0.314)		-.5222(0.778)	
Urdu	-1.1216 (1.886)[b]	-.0420	-1.1207(1.754)[b]	-.0030
μ (1)	2.3980(14.738)[a]		2.0868(13.247)[a]	
Sample Size	451		451	
Logl	-411.93		-397.64	
Logl (*Restricted*)	-458.65		-439.26	
$\chi^2_{(14)}$	93.454		83.244	

Notes. Marginal effects calculated at the sample means.

[a] Asymptotic *t*-ratios in parentheses - significant at 5 percent level

[b] Asymptotic *t*-ratios in parentheses - significant at 5 percent with one-sided *t* test

Table 6.

Estimated Coefficients of Native Languages from *Ordered Logit model*

	Speaking Fluency		Writing Fluency	
	Coefficient	Marg. Effect	Coefficient	Marg. Effect
Spanish	-1.2973	-.0130	-1.3770	-.0084
	(2.057)[a]		(2.060)[a]	
French	-.1994		-.5222	
	(.314)		(.778)	
Urdu	-1.1216	-.0420	-1.1207	-.0030
	(1.886)[b]		(1.754)[b]	

Source: Table 4. Marginal effects calculated at the sample means.

[a] Absolute *t*-ratios in parentheses - significant at 5 percent level

[b] Absolute *t*-ratios in parentheses - significant at 5 percent with one-sided t-test

Table 7

Estimates of Earnings Function (Dependent Variable = *Ln* Earn)

	OLS	IV
	Coefficients	Coefficients
Intercept	10.761(65.478)[a]	10.599(57.989)[a]
Exper	.0413(3.783)[a]	.0395(3.638)[a]
Expersq	-.0009(2.807)[a]	-.0008(2.601)[a]
Ysm	.0078(1.466)	.0122(2.117)[a]
Mar	.0450(0.722)	.0351(0.567)
Oslo	.1017(1.260)	.0994(1.241)
Ftime	.3160(5.067)[a]	.3021(4.851)[a]
Ojt	.0465(0.877)	.0543(1.030)
Nltp	.0266(0.419)	.2181(1.872)[b]
Ntest	.1440(2.213)[a]	.1181(1.793)[b]
Foreman	.0771(1.530)[b]	.0837(1.670)[b]
Country of Birth		
Chile	.1787(1.451)	.1583(1.291)
Morocco	.0972(0.795)	.0951(0.785)
Pakistan	.0568(0.506)	.0617(0.554)
Sample Size	302	302
R-sq.	.310	.289
$\overline{R} - sq$	.279	.257
F[*k, N-k*]	9.97	8.99

Note.- The t ratios are adjusted for heteroskedasticity using White's (1980) procedure.

[a] *t*-ratios in parentheses - significant at 5 percent level

[b] *t*-ratios in parentheses - significant at 5 percent with one-sided *t*-test

Table 8

Multinomial Logit Estimate of Hours of Norwegian Language Training (Reference: < 240 Hours)

	Coefficients (240 hours)	Coefficients (> 240 Hours)
Intercept	1.5375(2.008)[a]	6.3967(3.387)[a]
EducB	.0241(0.482)	-.0455(0.821)
EducA	.7502(1.877)[b]	1.3310(3.054)[a]
Nltp	-.5455(0.371)	-5.0555(4.616)[a]
Ageentry	-.0483(1.637)	-.0847(2.624)[a]
Ysm	-.1339(3.633)[a]	-.0408(1.123)
Mar	1.0732(2.359)[a]	.3647(0.783)
Lmtp	.9508(2.294)[a]	.7705(1.729)[b]
Oslo	-.5311(0.871)	-.4633(0.707)
Refugee	.1654(0.274)	.8850(1.375)
English Ability	1.3331(3.076)[a]	.3094(0.683)
Country of Birth		
Chile	.4709(0.512)	.9021(0.851)
Morocco	-.9615(1.165)	-.0713(0.074)
Pakistan	-.0447(0.057)	.6095(0.664)
Sample Size	302	
Corr. predictions (%).	65.6	
ρ	.294	
χ^2_{26}	190.6	

Notes: Dependent Variable = 1 if 240 Hours

Dependent Variable = 1 if Greater than 240 Hours

[a] Significant at 5 percent level

[b] Significant at 5 percent level with one-sided *t* test

ρ is a McFadden pseudo R-sq.

Table 9

Earnings Equation Estimates (Dependent Variable = Log Earn)

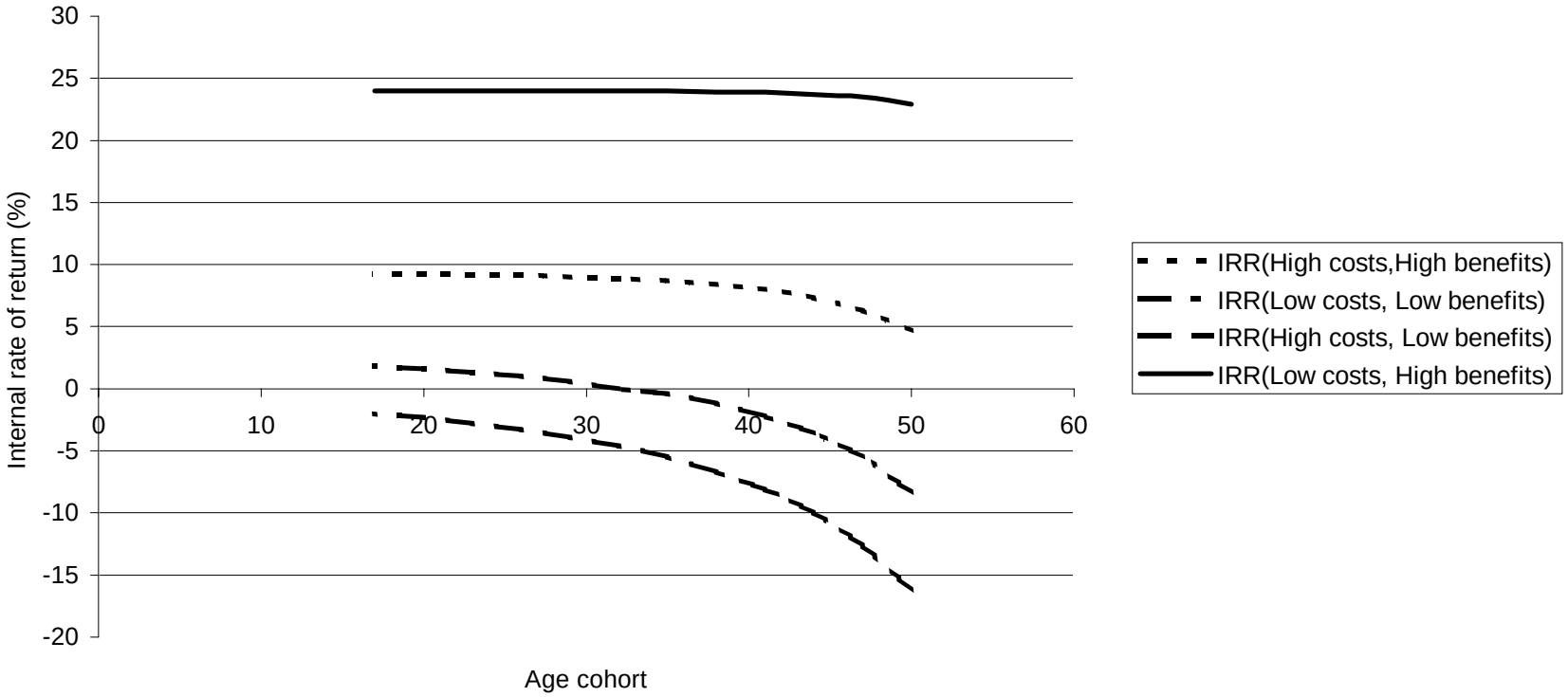
	240 Hours		> 240 hours	
	OLS	Consistent	OLS	Consistent
Intercept	11.290(32.663)[a]	11.511(21.524)[a]	10.436(36.888)[a]	10.421(25.191)[a]
EducB	-.0019(0.130)	-.0015(0.118)	.0121(1.238)	.0120(1.198)
EducA	.0805(0.912)	-.0701(0.711)	.1016(1.200)	.1002(1.150)
Exper	.0232(1.154)	.0255(1.071)	.0412(2.319)[a]	.4114(2.718)[a]
Expersq	-.0001(0.264)	-.0003(0.352)	-.0010(2.227)[a]	-.0010(2.734)[a]
Ysm	.0031(0.247)	.0001(0.012)	.0143(1.509)	.0145(1.450)
Ftime	.2874(2.570)[a]	.2909(2.532)[a]	.3074(3.016)[a]	.3072(3.010)[a]
Oslo	.0157(0.137)	.0055(0.046)	.1603(1.180)	.1615(1.187)
Mar	-.0189(0.162)	.0038(0.030)	.0912(0.963)	.0899(0.922)
Ntest	.0734(0.598)	.0775(0.606)	.2428(2.484)[a]	.2432(2.503)[a]
Foreman	.2067(2.316)[a]	.2202(2.151)[a]	.0308(0.452)	.0304(0.439)
Ojt	.0572(0.586)	.0625(0.598)	.0327(0.422)	.0333(0.439)
Country of Birth				
Chile	-.1607(0.714)	-.1569(0.683)	.2703(1.241)	.2693(1.251)
Morocco	-.0927(0.388)	-.1013(0.418)	.1463(0.643)	.1472(0.638)
Pakistan	-.1298(0.607)	-.1296(0.594)	.1043(0.516)	.1029(0.519)
$\hat{\lambda}$		-.6352(0.465)		.0446(0.056)
Sample Size	99	99	130	130
$R-sq.$	.290	.292	.366	.366
$\overline{R}-sq$	.172	.164	.289	.282
F[*k, N-k*]	2.45	2.28	4.74	4.38
$\sigma^2_{u_1,u_2}$		0.1811		0.1761

Note.- The t ratios are adjusted for heteroskedasticity using White's (1980) procedure.

[a] Significant at 5 percent level

[b] Significant at 5 percent level with one-sided *t* test

Figure 1
The internal rate of return (IRR) associated with a shift from 240 hours to more than 240 hours of Norwegian language training



Source: John E. Hayfron (1997). "Language Training, Language Proficiency and Earnings of Immigrants in Norway".

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