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MEASURED ABILITY, EDUCATIONAL ATTAINMENT, AND EARNINGS OF VOCATIONAL TRAINEE-GRADUATES: SOME EMPIRICAL EVIDENCES

by

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ABSTRACT

The basic aim of the paper is to clarify the empirical relationship among measured ability, educational attainment, exposure to vocational training and wage earnings among a specific group of the work force which are aptly described as less-skilled, and hence, less-paid. The hypothesized causal directions among the prime explanatory variables with respect to (initial) daily wage earnings follow the a priori statements. However, the degree of statistical significance varies widely but with consequently important implications. The results of the study re-emphasize the importance of educational attainment in the employer's hiring decision at the entry point of the labor market even after exposure to vocational training. The length of time between graduation from the vocational training program and evaluation shows a marked direct influence in daily wage earnings which suggests an enhancement of the quality of labor skill resulting into more employment opportunities so that vocational trainee-graduates can search for an employer who is willing to pay a relatively high initial wage rate in a given labor market.

Measured ability as well as the length of exposure to vocational training courses (in hours) have no statistical significance in the explanation of the variations in daily wage earning. Indeed, one may speculate that these variables have more explanatory (and predictive) capacity for explaining the variations in acquired skills rather than daily wage earnings. On the other hand, measured ability would have accounted significantly for more of the variance in wage earnings had an aggregate measure of the regressand was used as a measure of the theoretical construct (which would capture the cumulative differentials in wage increases due to varying productivity in a given time period) instead of earnings per unit time.

MEASURED ABILITY, EDUCATIONAL ATTAINMENT, AND EARNINGS OF VOCATIONAL TRAINEE-GRADUATES: SOME EMPIRICAL EVIDENCES*

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I. Introduction

The human capital literature which investigates specifically the determinants of earnings has focused mainly on the role of schooling in the explanation of variations of earnings. A section in the review of past empirical studies by Rosen (1971), which posits the direct relationship between schooling and earnings, has been devoted on this topic. Though the effect of ability on earnings has not been taken for granted, it is not subjected to the same rigor in quantitative measurement as the other determinants of earnings. Such bias on income due to ability has been subjectively treated as a component of the unexplained variations. Becker (1967), for example, has defined the difference between the negatively-sloping and non-intersecting marginal rates of return curves for two individuals, which are expressed in terms of investments in human capital,

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as being attributed to differential in ability. Such ability is further defined as the capacity to increase future earnings given present investment in one's human capital and which is determined by a combination of "...genetic factors, previous investments, experience (including schooling), and others difficult to unravel statistically....". The problem with the definition, however, is that there exists no explanation as to the possible influence of ability on the earnings profile.

Researchers have basically agreed that the non-exclusion of the ability variable in earnings function studies is due to the scarcity of the data which measure this theoretical construct. In general, any available suitable measurement which is designed to scale ability is conceived as a big boost in the analysis (see Gintis 1971). The present standard measure of this theoretical construct is the Intelligence Quotient (IQ) test score which has been designed originally to predict school performance rather than earnings variation. However, Rosen (1971, p. 17) has stated that by using IQ as a quantitative measure of the theoretical construct, the definition of ability could be further refined into: (a) a notion of latent skills of which the IQ is treated as an indirect measurement, and (b) a gauge for efficiency with which an individual could acquire additional skills. The latter concept appears to be the appropriate raison d'être to justify the use of IQ test score as an explanatory variable in earnings function studies.

Hause (1972, p. S111) has explained the role of measured ability and schooling on earnings as well as provided some empirical proofs based on several available sample data. The paper has posited specifically that: (a) there exists a complementarity effect between measured ability and schooling on earnings, and (b) the ability coefficient tends to increase at higher levels of education. It follows from the complementarity hypotheses that measured ability and schooling should not be treated absolutely as separate and independent arguments in earnings function studies. Rather, an interaction term could be provided in the estimation procedures in order to account for such behavioral assumption. The results of the statistical tests based on: (a) pooling the schooling-attainment categories, and (b) patterns of the ability coefficients of the regression estimations within schooling class has significantly supported the above hypotheses. Furthermore several empirical studies have strongly supported the positive association among schooling, measured ability, as well as family background variables (see Bowles 1972; Hauser 1973; and Griliches and Mason 1972).

This paper directs its attention however on the determinants of earnings among the less-skilled members of the labor force where a growing catalogue of past researches has been compiled until the last decade (see Zymelman 1976). One of the consequences of the rising inequality in income distribution as well as restrictive access to the education capital market is the difficulty to acquire a formal education in a competitive economy. Human capital investment decisions, which are dictated mainly by present income as well as initial endowment, display consequently alternative individual choices. Preferences are shifted to less-quality formal education or no formal education at all for those individuals who cannot afford the cost of a high quality formal education. This results ultimately into a socially less-desirable state of affairs: hence, the need for a government intervention which might be partially pursued through vocational training programs.

Borus (1964), using a sample of retrained workers, has regressed weekly income against area, subject matter of the course, training status, age, marital status, number of dependents, education, and number of weeks from the end of re-training to the date of the interview. The latter variable is a proxy measure for experience after undergoing the training program. Training status, age, education, and length of time between the termination of re-training and interview have been estimated to be significant explanatory variables in the regression analysis. Based on a sample of previously unemployed, Stromsdorfer (1968) has examined the influence of training status, previous labor force experience, labor market area, occupation, age, education, sex, race, marital status, and mobility using the total earnings within an 18-month period after the training program as the dependent variable. Training status, previous labor force experience, labor market area, age, education, sex, and mobility have explained significantly the variations in total earnings. Arcelo (1980) has estimated the occupation variable and the industrial classification of the firms as well as age, sex, and marital status as significant variables in the earnings function using a sample of vocational and technical graduates. Father's occupation and income, which are directly correlated with the quality of the schools, have been discovered also to be markedly influencing factors in annual earnings variation. Similarly, honors which are attained upon graduation have displayed expectedly the same significant effect.

The reviewed studies so far have failed to account for the role of measured ability in the earnings function of the less-skilled members of the work force. As stated earlier, such effect has been assumed to be a component of the unexplained variation in the regression estimation. However, Hansen et al (1970) has provided some empirical proofs of the relationship between measured ability and earnings among the target population. Using a sample described as male low-achievers as measured by the Armed Forces Qualification Test (AFQT) scores, the regressors are the following: education, age, race, training, marital status, family size, location of residence, marital status of parents (whether divorced or not), and AFQT score. Family size, marital status of parents, and whether the trainee comes from the South are measures which are designed to capture the socio-economic dislocations of the individual on the assumption that such would inversely affect the income-generating capacity of the individual. Except for the variables marital status of parents and family size, all of the regressors have been estimated to be significantly related to annual earnings. Specifically, AFQT scores have influenced positively the level of annual earnings.

The different sets of explanatory variables used in the reviewed researches have accounted for an average of 27 per cent of the total variance in the regressant. Furthermore, the series of estimated multiple regression equations have used various measures of the wage income as the dependent variable (i.e., weekly, annually, etc.).

2. The Earnings Function

2.1 The Model

This paper aims to estimate an earnings function which is expressed primarily in terms of measured ability and educational attainment based on a recursive model specification. The simple recursive system assumes that educational attainment as well as individual background variables (i.e., socio-economic attributes) affect the level of measured ability at a given time period. On the other hand, measured ability is not hypothesized to influence causally the educational attainment and socio-economic background variables. Then, measured ability and vocational training program characteristics as well as the individual socio-economic attributes (including educational attainment) are posited to influence the level of wage earnings.

The specified recursive model is sketched simply as follows:

Let

(1) $a = a(e; z), \quad \frac{\partial a}{\partial e} > 0, \ \frac{\partial a}{\partial z} > 0$

where

a = measured ability

e = educational attainment

z = a vector of individual socio-economic attributes

Equation (1) explains measured ability as a function of educational attainment and a set of socio-economic attributes. Higher levels of education is assumed to affect directly the level of measured ability. Similarly, superior levels of socio-economic attributes influence directly the level of measured ability. Then, the earnings function which is expressed in terms of measured ability and educational attainment after controlling for the effects of vocational training course characteristics and individual socio-economic attributes is specified as follows:

(2) $w = w(e, a; x, z), \quad \frac{\partial w}{\partial e} > 0, \ \frac{\partial w}{\partial a} > 0, \ \frac{\partial w}{\partial x} > 0, \ \frac{\partial w}{\partial z} > 0$

where

w = wage earnings

x = a vector of vocational training program characteristics

Wage earnings is directly related to educational attainment and measured ability. Similarly, superior levels of vocational training program as well as individual socio-economic characteristics influence directly the level of wage earnings. The final wage earnings function is written after the substitution of Equation (1) into Equation (2) as follows:

$$(3) \quad w = w(e, a\ (e, z);\ x, z)$$

Equations (1), (2), and (3) describe the simple recursive system where the measured ability function is initially estimated using Equation (1) and, then, its predicted value becomes a regressor in Equation (3). As noted earlier, simultaneity between wage earnings and measured ability as well as educational attainment is avoided consequently in this model.

2.2 Estimation Procedures

Specify a linear function for Equation (3) in order to capture the effects of measured ability and educational attainment after controlling for the vocational training program as well as individual socio-economic characteristics. Hence,

$$(4) \quad W = \beta_0 + \beta_1 a + \sum_{i=1}^{n} \beta_{2i} Q + \beta_3' X + \beta_4' Z + u$$

where u is a random error term.

β_1 measures the rate of change in wage earnings per unit change in measured ability. By standard expression of the hypothesis, $\beta_1 > 0$. On the other hand, educational attainment is represented as a categorical variable. If we let the highest educational-attainment category (i.e., college graduate) be the reference class, then the sign of each β_{2i} for $i = 1, 2, \ldots, n$ must be negative. That is, we reiterate the hypothesis that vocational trainee-graduates with college degrees tend to have higher average wage earning than non-college graduates.

x and z are treated as the vectors of vocational training program and individual socio-economic characteristics, respectively. Hence, β_3' and β_4' represent, in general, the row vectors in which the elements are the corresponding regression coefficients.

A semi-logarithmic earnings function is fitted to Equation (3) following the tradition initiated by Mincer (1970) which is written as follows:

$$(5) \quad \ln w = \delta_0 + \delta_1 a + \sum_{i=1}^{n} \delta_{2i} Q + \delta_3' x + \delta_4' Z + v$$

where v is a random error term.

Furthermore, the marginal effect of the simultaneous interaction between measured ability and length of exposure to vocational training (which is measured in hours) on wage earnings is captured through an interaction term in the specification. The expected sign of the coefficient of the interaction term is positive which is simply a variant of the complementarity hypothesis by Hause (1972).

The parameters of Equations (4) and (5) will be estimated using the Ordinary Least Squares technique. The selection of the appropriate determinants of the earnings variation is done systematically following a forward selection method (see Maddala 1977).

3. The Data Base

3.1 The Data

The basic source of the data is the Technical Research Staff of the National Manpower and Youth Council (NMYC). The required information are contained in three (3) administrative reports, namely: (a) enrolment, (b) placement and absorption, and (c) terminal reports. These various reports are submitted periodically and cover several training course programs that are conducted by the NMYC. Unfortunately, the complete data on the three (3) reports are available only in Region VII (Central Visayas) and Region VIII (Eastern Visayas).

The enrolment report contains the data on pre-training variables such as: (a) name of trainee, (b) address of trainee, (c) sex, (d) marital status, (e) educational attainment, (f) prior labor force participation, (g) type of training course, and (h) number of hours of training. The absorption and placement report covers information on: (a) occupation after training, (b) status of employment, and (c) daily wage earnings. The terminal report summarizes the training course inputs and outputs and lists the information on: (a) type of training program, (b) location of training center, (c) initial and terminal dates of training, (d) number of trainee in a class, (e) number of trainee-graduates, and (f) total NMYC program expenditures.

A one-to-one correspondence scheme is established based on the three (3) main reports that are available. For any particular individual vocational trainee-graduate, the information are gathered summarizing his pre-training and post-training attributes. For any particular vocational training course program, the data are tabulated detailing the training course inputs and outputs. This implies consequently that incomplete records limit the sample size since the data profile of any individual vocational trainee-graduate is discarded automatically if one of the main reports is missing.

The total original sample is categorized dichotomously into vocational trainee-graduates who are employed and unemployed after the vocational training program. A total of 751 vocational trainee-graduates that is generated by the retrieval exercise constitutes the sample size (see Table 1). Approximately 46.7 per cent of the total sampling units have found employment after undergoing the training program and this represents the data base that is utilized in the study.

The sub-sample is further reduced in size when an attempt to retrieve the Multi-Aptitude Test Battery scores is conducted. The aptitude test is given by the NMYC to the applicants in order to assess their innate skills and match such talent with the array of skill-developing vocational training courses. Apparently, not all of the vocational trainee-graduates are subjected to the aptitude

Table 1

SIZE OF THE SAMPLE OF VOCATIONAL-TRAINEE GRADUATES USED IN THE STUDY

	No.	%
1. Total sampling units retrieved	751	100.00
2. a. Vocational trainee-graduates who are employed after the training course program	351	46.74
b. Vocational trainee-graduates who have aptitude scores	136	38.75

examination. Approximately 38.8 per cent of those who are employed after the vocational training have the data on the aptitude scores. Furthermore, the results of the aptitude test are expressed in terms of raw scores which are then translated into their equivalent percentiles. The latter is the measurement of the theoretical construct that is used in this paper.

The sampling frame which is used in the study is the list of trainee-graduates who have undergone various vocational training courses that are conducted in Central and Eastern Visayas in 1979. A significant level of caution however must be exercised in the estimation of the exact magnitude of the sampling list since "figure-dressing" (that is, counting a single trainee in several training courses) is quite significant. Hence, there is no definite and exact estimate of the population size that is included in the study.

3.2 Data Notation

The following enumerates the notation of the variables used in the study, namely:

DWAGE = daily wage earnings (in pesos)

LDWAGE = natural logarithm of DWAGE

AGE = age (in years)

SEX = sex classification which takes a value of 1 if the individual is male and 0 if female

EDUC = educational attainment which takes a value of 1 if the individual belongs to cohort k and 0 otherwise where k is

EDUC1 = elementary undergraduate

EDUC2 = elementary graduate

EDUC3 = high school undergraduate

EDUC4 = high school graduate

EDUC5 = college undergraduate

EDUC6 = college graduate

OCAT = occupation after training which takes a value of 1 if the individual belongs to cohort k and 0 otherwise where k is

OCAT1 = machinist, auto mechanic, welder, utility lineman, latheman, etc.

OCAT2 = librarian, clerk, government employee, etc.

OCAT3 = beautician, manicurist, dressmaker, tailor, barber, etc.

OCAT4 = shop helper, utility aide, labcrer, carpenter, driver, etc.

OCAT5 = farmer

OCAT6 = salesman, household technician, etc.

OCAT7 = self-employed

NDEP = number of dependents

CIVST = marital status which takes a value of 1 if the individual is married and 0 otherwise

IQTS = Multi-Aptitude Test Battery total score (in percentile)

STEMP = status of employment which takes a value of 1 if the individual is permanently employed and 0 otherwise

HRST = number of hours of vocational training

SIZEC = size of the vocational training class

XPERT = mean NMYC expenditure per trainee

MGBE = number of months between graduation from the vocational training course program and evaluation (a proxy variable for experience after undergoing a vocational training program)

4. Regression Results

Table 2 presents the outcome of the selection of appropriate determinants of daily wage earnings using the forward selection technique. The exercise has come up with nine (9) regression runs in building the model through the constant selection of the best estimated equation out of each finite number of permutations of a given set of explanatory variables.

The initial regression equation has showed that the categorical variables denoting the occupation after training represent the most significant explanatory factors that account for the variations in daily wage earnings (see Equation 1). The reference class in this set of categorical variables is the self-employed. The regression estimation reflects that only the workers classified as beauticians, manicurists, dressmakers, tailors, and barbers receive a higher average daily wage earning than the self-employed at a significant level. The other occupational groups work for a lower daily wage than the self-employed where the difference is quite accentuated with respect to librarians, clerks, government employees, salesmen, and household technicians.

Table 2. SELECTION OF APPROPRIATE DETERMINANTS OF EARNINGS: DWAGE AS DEPENDENT VARIABLE
(n = 351 Vocational Trainee-Graduates)

Regression Equation No.	OCAT1	OCAT2	OCAT3	OCAT4	OCAT5	OCAT6	MBGE	HRST	$HRST^2$
1	-10.832 (-4.266)*	-6.474 (-1.937)**	-4.075 (-1.638)***	-13.082 (-4.254)*	-10.343 (-4.285)*	-8.531 (-2.533)*			
2	-7.662 (-3.009)*	-7.940 (-2.442)*	-2.307 (-0.946)	-9.010 (-2.910)*	-7.842 (-3.274)*	-5.429 (-1.645)**	1.192 (4.835)*		
3	-8.383 (-3.355)*	-9.691 (-3.016)*	-2.790 (-1.167)	-8.613 (-2.840)*	-4.976 (-2.029)**	-4.708 (-1.455)***	1.568 (6.052)*	-0.008 (-3.993)*	
4	-3.917 (-1.338)***	-7.237 (-2.196)**	-0.368 (-0.146)	-5.701 (-1.798)**	-4.855 (-2.000)**	-3.151 (-0.970)	1.834 (6.721)*	0.019 (1.961)**	-0.00002 (-2.849)*
5	-6.145 (-1.875)**	-8.902 (-2.565)*	-0.879 (-0.347)	-6.993 (-2.132)**	-5.320 (-2.178)**	-4.165 (-1.257)***	1.878 (6.885)*	0.016 (1.529)***	-0.00002 (-2.558)*
6	-5.918 (-1.776)**	-9.254 (-2.581)*	0.106 (0.041)	-6.026 (-1.816)**	-4.319 (-1.724)**	-3.086 (-0.910)	1.832 (6.584)*	0.011 (1.027)	-0.00001 (-2.008)**
7	-5.775 (-1.703)**	-9.156 (-2.533)*	0.267 (0.100)	-5.933 (-1.773)**	-4.317 (-1.721)**	-3.002 (-0.879)	1.838 (6.572)*	0.011 (1.012)	-0.00001 (-1.996)**
8	-5.422 (-1.598)***	-8.881 (-2.459)*	0.684 (0.254)	-6.097 (-1.624)**	-4.572 (1.821)**	-2.994 (-0.878)	1.838 (6.585)*	0.011 (1.044)	-0.00001 (-2.031)**
9	-5.040 (-1.492)***	-7.564 (-2.077)**	1.301 (0.483)	-5.724 (-1.720)**	-4.840 (-1.936)**	-2.614) (-0.770)	1.739 (6.183)*	0.005 (0.454)	-0.00001 (-1.453)***
10	-0.660 (-0.186)	-5.228 (-1.436)***	4.356 (1.565)***	-2.634 (-0.778)	-3.847 (-1.556)***	-0.085 (-0.025)	1.804 (6.512)*	0.010 (0.920)	-0.00001 (-2.010)**
11	0.085 (0.023)	-4.269 (-1.096)	5.400 (1.707)**	-1.888 (-0.532)	-2.802 (-0.969)	-0.253 (-0.074)	1.767 (6.252)*	0.009 (0.845)	-0.00001 (-1.912)**

Estimates inside the parentheses are the corresponding t-values.

*Significant at 1 percent.

**Significant at 5 percent.

***Significant at 10 percent.

*Significant at 1 percent.

**Significant at 5 percent.

***Significant at 10 percent.

Table 2
(Continued)

Regression Equation No.	SEX	EDUC1	EDUC2	EDUC3	EDUC4	EDUC5	AGE	AGE^2
1								
2								
3								
4								
5	1.730 (1.502)***							
6	1.943 (1.677)*	-4.509 (-1.324)***	-5.930 (-1.743)**	-6.299 (-1.886)**	-5.259 (-1.564)***	-6.802 (-1.978)**		
7	1.962 (1.691)**	-4.593 (-1.340)***	-5.971 (-1.750)**	-6.332 (-1.891)**	-5.325 (-1.576)***	-6.854 (-1.986)**	0.011 (0.236)	
8	2.064 (1.763)**	-4.310 (-1.258)***	-5.788 (-1.700)**	-5.984 (-1.786)**	-5.082 (-1.505)***	-6.762 (-1.963)**	0.310 (1.516)***	-0.004 (-1.502)***
9	1.810 (1.546)***	-3.456 (-1.008)	-4.405 (-1.278)	-4.707 (-1.892)**	-3.626 (-1.059)	-5.406 (-1.553)***	0.271 (1.328)***	-0.003 (-1.310)***
10	1.585 (1.376)***	-8.033 (-2.226)**	-8.633 (-2.405)*	-9.139 (-2.574)*	-8.065 (-2.248)**	-9.353 (-2.600)*	0.147 (0.721)	-0.002 (-0.752)
11	1.544 (1.338)***	-8.420 (-2.304)**	-9.055 (-2.485)*	-9.605 (-2.657)*	-8.502 (-2.332)*	-9.717 (-2.671)*	0.153 (0.751)	-0.002 (-0.783)

Estimates inside the parentheses are the corresponding t-values.

*Significant at 1 percent.

**Significant at 5 percent.

***Significant at 10 percent.

Table 2
(Continued)

Regression Equation No.	SIZEC	$SIZE^2$	STEMP	Constant	R^2	$\bar{R}^2$	F	Partial Correlation Coefficient
1				22.906	0.138	0.123	9.20	-0.224, -0.104, -0.088, -0.224, -0.225, -0.136, respectively
2				17.220	0.193	0.177	11.74	0.253
3				18.391	0.229	0.211	12.710	-0.211
4				9.668	0.247	0.227	12.43	-0.152
5				12.337	0.252	0.230	11.46	-0.081
6				18.175	0.267	0.232	7.59	0.050
7				18.332	0.265	0.230	7.53	0.020
8				13.022	0.270	0.233	7.24	-0.082
9	0.046 (2.176)**			11.965	0.280	0.241	7.18	0.119
10	0.190 (4.172)*	-0.001 (-3.554)*		11.239	0.306	0.267	7.70	-0.192
11	0.191 (4.202)*	-0.001 (-3.572)*	0.171 (0.696)	10.658	0.308	0.266	7.33	0.038

Estimates inside the parentheses are the corresponding t-values.

*Significant at 1 percent.

**Significant at 5 percent.

The regression coefficient for the proxy variable for experience after undergoing the vocational training course is not only markedly significant but has also confirmed the posited direction of causality as seen in Equation 2. Meanwhile, Equation 3 illustrates that the number of hours of exposure to the vocational training implies the opposite of the stated hypothesis. Equation 4 however has corrected for the mismatching of the sign and the standard hypothesis through a parabolic specification. The coefficient of the number of hours of training exhibits markedly a positive sign while the opposite sign describes the coefficient of the square of the variable at a significant level.

Equation 5 suggests that male vocational trainee-graduates have received significantly a higher mean daily wage earning than the females after controlling for the type of occupation as well as experience after the vocational training and the number of hours of exposure. This observation appears to be verified repeatedly throughout the estimation procedure. Equation 6 shows that the next variable in the hierarchy of significant regressors in the model is the level of educational attainment. As a general rule, vocational trainee-graduates who have finished a college degree receive a higher average daily wage earning than the non-college graduates.

The estimation has further revealed that a non-significant and direct relationship exists between the age level of the vocational trainee-graduate and daily wage earnings. The additional specification of a parabolic relationship establishes the nonlinear and significant relationship between age and daily wage earnings (see Equations 7 and 8).

Daily wage earnings is estimated to be directly correlated with the size of the vocational training class at a significant level. However, the marginal rate of change in daily wage earnings decreases significantly after a determinate optimum class size (see Equations 9 and 10). Furthermore, the status of employment of the vocational trainee-graduates suggests that those individuals with permanent employment status have expectedly a higher average daily wage earning than the temporary employed after controlling for all the previously included explanatory variables (see Equation 11). The estimated multiple regression equation has shown however that status of employment is a detrimental variable though it has the highest partial correlation coefficient in the permutation.

The forward selection exercise that is outlined above using the actual values of daily wage earnings as the dependent variable has generated an R^2 which is equal to

30.6 per cent. That is, occupation after training, number of months between graduation and evaluation, number of hours of training, sex, educational attainment, age, and size of the vocational training class have accounted for 30.6 per cent of the total variations around daily wage earnings.

Table 3 illustrates the resulting sequential estimation of the earnings function model using the natural logarithm of daily wage earnings as the dependent variable. The semi-logarithmic specification of the earnings function have yielded nine (9) sequentially-estimated regression equations.

Parallel to the results of the earlier forward selection exercise, Equation 1 shows that the type of occupation after training explains initially a greater proportion of the adjusted total variation around the dependent variable. With reference again to the group of self-employed, only the class of workers classified as beauticians, manicurists, dressmakers, tailors, and barbers has received significantly a higher average daily wage earning. Though the initial occupation group consisting of machinists, auto mechanics, welders, utility linemen, and lathemen as well as the category composed of salesmen and

Table 3. SELECTION OF APPROPRIATE DETERMINANTS OF EARNINGS: LDWAGE AS DEPENDENT VARIABLE
(n = 351 Vocational Trainee-Graduates)

Regression Equation No.	OCAT1	OCAT2	OCAT3	OCAT4	OCAT5	OCAT6	MBGE	SIZEC	SIZEC^2
1	-0.416 (-2.318)**	-0.103 (-0.435)	-0.062 (-0.355)	-0.715 (-3.288)*	-0.493 (-2.890)*	-0.260 (-1.099)			
2	-0.264 (-1.638)***	-0.173 (-0.741)	0.022 (0.128)	-0.519 (-2.328)*	-0.373 (-2.163)**	-0.110 (-0.464)	0.057 (3.231)*		
3	-0.128 (-0.680)	-0.008 (-0.032)	0.159 (0.882)	-0.421 (-1.885)**	-0.399 (-2.332)*	-0.027 (-0.115)	0.051 (2.901)*	0.004 (2.808)*	
4	0.001 (0.006)	0.108 (0.441)	0.258 (1.385)***	-0.345 (-1.529)***	-0.402 (-2.368)*	0.036 (0.151)	0.050 (2.830)*	0.010 (3.080)*	-0.00003 (-2.042)**
5	-0.001 (-0.003)	0.072 (0.295)	0.262 (1.413)***	-0.315 (-1.401)***	-0.306 (-1.726)**	0.074 (0.312)	0.062 (3.326)*	0.011 (3.324)*	-0.00004 (-2.194)**
6	0.236 (1.043)	0.188 (0.755)	0.379 (1.987)**	-0.166 (-0.703)	-0.298 (-1.688)**	0.150 (0.624)	0.078 (3.878)*	0.010 (3.287(*	-0.00004 (-2.455)*
7	0.062 (0.246)	0.055 (0.208)	0.332 (1.703)**	-0.267 (-1.094)	-0.332 (-1.869)**	0.068 (0.279)	0.082 (4.035)*	0.010 (3.124)*	-0.00004 (3.124)*
8	0.104 (0.399)	-0.005 (-0.019)	0.408 (2.019)**	-0.182 (-0.727)	-0.260 (-1.421)***	0.132 (0.522)	0.084 (4.076)*	0.011 (3.464)*	-0.0001 (-2.821)*
9	0.063 (0.239)	-0.024 (-0.087)	0.380 (1.856)**	-0.196 (-0.782)	-0.271 (-1.475)***	0.085 (0.328)	0.083 (4.034)*	0.012 (3.554)*	-0.0001 (-2.923)*

Estimates inside the parentheses are the corresponding t-values.

*Significant at 1 percent.

**Significant at 5 percent.

***Significant at 10 percent.

Table 3
(Continued)

Regression Equation No.	HRST	$HRST^2$	SEX	EDUC1	EDUC2	EDUC3	EDUC4
1							
2							
3							
4							
5	-0.0003 (-1.906)**						
6	0.001 (1.666)**	-0.000 (-2.082)**					
7	0.001 (1.297)***	-0.000 (-1.841)**	0.127 (1.513)***				
8	0.001 (1.216)	-0.000 (-1.793)**	0.145 (1.711)**	-0.506 (-1.901)**	-0.484 (-1.819)**	-0.525 (-2.001)**	-0.420 (-1.581)**
9	0.001 (1.118)	-0.000 (-1.777)**	0.136 (1.594)***	-0.517 (-1.940)**	-0.487 (-1.829)**	-0.532 (-2.027)**	-0.410 (-1.543)***

Estimates inside the parentheses are the corresponding t-values.

*Significant at 1 percent.

**Significant at 5 percent.

***Significant at 10 percent.

Table 3
(Continued)

Regression Equation No.	EDUC5	XPERT	INTERCEPT	R^2	$\bar{R}^2$	F	Partial Correlation Coefficient
1			2.833	0.111	0.096	7.16	-0.124, -0.023, -0.019, -0.174, -0.154, -0.059, respectively
2			2.559	0.137	0.120	7.80	0.172
3			2.353	0.157	0.137	7.95	0.150
4			2.372	0.164	0.142	7.44	-0.09
5			1.996	0.172	0.147	7.05	-0.10
6			2.214	0.178	0.152	6.70	-0.09
7			1.899	0.192	0.163	6.68	-0.082
8	-0.529 (-1.984)**		2.307	0.205	0.164	5.04	-0.104, -0.099, -0.109, -0.086, -0.108, respectively
9	-0.539 (-2.017)**	0.0004 (0.653)	2.256	0.206	0.164	4.80	0.047

Estimates inside the parentheses are the corresponding t-values.

*Significant at 1 percent.

**Significant at 5 percent.

***Significant at 10 percent.

household technicians are estimated to work at higher average daily wages than the self-employed, the estimated regression coefficients are not statistically significant. The coefficients of the initial categorical variables further reflect partially that farmers toil for a markedly lower daily wage earning than the self-employed.

The hypothesis that is forwarded earlier with respect to the influence of the proxy variable for experience after undergoing the training course is similarly verified as shown in Equation 2. That is, the more experience the vocational trainee-graduate has after the vocational training course program, the higher the level of his daily wage earnings.

The third best equation reflects that the size of the training class adds the highest increment to the explained variation. Similar to the earlier finding, a direct relationship describes significantly the size of the training class and daily wage earnings. However, Equation 4 suggests that daily wage earnings decline as the size of the class is increased incrementally beyond a certain optimum size.

The result of the initial run using the number of hours of training as the explanatory variable has violated significantly the traditional hypothesis on the direct relationship between exposure to vocational training and daily wage earnings (see Equation 5). Thus, Equation 6 has been specified in order to correct for this result using a parabolic daily wage earnings function, ceteris paribus.

On the average, males in the sample receive significantly a higher mean daily wage earning than the females (see Equation 7). This result confirms the earlier similar outcome using the actual values of the daily wage earnings as the dependent variable. The significant influence of educational attainment in explaining a greater proportion of the total variation around the daily wage earnings is presented in Equation 8. The regression estimates repeat the previous findings that vocational trainee-graduates who have finished a college degree tend to have a higher mean daily wage earning than the non-college graduates in the sample.

The last regressor which is added to the previously estimated regression equation is the mean expenditure per trainee (see Equation 9). The positive estimated regression coefficient of mean expenditure per trainee, which happens to be a superflous variable, confirms the direct relationship between expenditure per trainee and daily wage earnings though at a nonsignificant level. However, this result appears to be quite interesting in the sense that previous permutations which were done in the forward selection exercise have yielded a negative coefficient for the mean expenditure per trainee variable. Such variable is selected consistently as the appropriate regressor only after the size of the training class is included in the specification. This is an indication of a lesser explanatory (and predictive) capacity of the expenditure per trainee variable as compared to the size of the training class variable in the earnings function. A multicollinearity problem was earlier pointed out as the underlying cause after a high level of correlation was established between size of the training class and mean expenditure per trainee (see Appendix B).

Another interesting observation made in the statistical exercise is that the coefficient of the mean expenditure per trainee exhibits a positive sign only after controlling for the type of training courses. However, the coefficients of the categorical variables did not conform to the expected hypothesis; hence, type of training courses as an explanatory variable was dropped from the estimation procedure.

The natural logarithm of daily wage earnings seems to be a less efficient measure of the regressand. The best estimated multiple regression equation has been able to extract only an R^2 of 20.6 per cent which is approximately 10 percentage points less than that computed in Equation 10 of the previous table with almost a similar set of explanatory variables.

5. The Role of Measured Ability

5.1 Regression Results: Measured Ability as the Dependent Variable

Table 4 presents the results of the multiple regression estimation based on a subsample of 136 vocational trainee-graduates. Measured ability, as the dependent variable, is measured in terms of percentile scores rather than the raw total scores since the former account for a higher variance in the dependent variable. This result has been completely verified in the preliminary regression runs using both types of measures of measured ability.

Table 4. ESTIMATED REGRESSION EQUATION USING MEASURED ABILITY AS THE DEPENDENT VARIABLE (n = 136 vocational trainee-graduates)

Regressor	Regression Coefficient	t-ratio
EDUC1	- 27.923	-2.962*
EDUC2	- 19.662	-2.188**
EDUC3	- 10.688	-1.376***
EDUC4	- 5.354	-0.686
EDUC5	8.776	0.968
SEX	8.729	2.446*
Intercept	61.696	
R^2	0.228	
$\bar{R}^2$	0.192	
F	6.35	

*Significant at 1 per cent.

**Significant at 5 per cent.

***Significant at 10 per cent.

Vocational trainee-graduates with college degrees have a higher level of measured ability than the rest of the education cohorts except with respect to the college undergraduates. The regression results illustrate that college undergraduates tend to have, insignificantly, a level of measured aptitude higher than those vocational trainee-graduates with college degrees.

Similarly, male vocational trainee-graduates have higher measured ability than the female cohorts. On the average, the males in the sample register significantly an approximate of nine (9) percentile points than the females.

The level of educational attainment and sex classification of the vocational trainee-graduates are able to account for nearly a quarter of the total variation in measured ability which is measured in terms of the percentile scores.

5.2 Effect of Measured Ability on Earnings

Table 5 summarizes in brief the results of the additional inclusion of measured ability in the estimated earnings function using Equations 10 and 9 in Tables 2 and 3, respectively. The exact estimated multiple regression equation is presented in Appendices Ca and Cb. Only standard human capital variables as well as the number of hours of exposure to vocational training are included in the tabular presentation.

The causal influence of educational attainment on daily wage earnings even after controlling for measured ability has been further corroborated in this section of the paper. That is, the vocational trainee-graduates without college degrees tend to receive significantly a lower average daily wage earning than the vocational trainee-graduates with college degrees. Similarly, the number of hours of vocational training (and its square) appear to be consistent with the estimates in the previous section.

There exists a positive relationship between measured ability and daily wage earnings. The estimated multiple regression equations using the actual as well as the natural logarithm of daily wage earnings have borne out this finding. However, the estimated regression coefficients for measured ability are not significant at the various levels of statistical significance.

Table 5. EFFECTS OF EDUCATIONAL ATTAINMENT, HOURS OF VOCATIONAL TRAINING AND MEASURED ABILITY ON DAILY WAGE EARNINGS HOLDING OTHER EXOGENOUS VARIABLES AS CONSTANT

Regressor	DWAGE as Dependent Variable Coefficient	t-ratio	LDWAGE as Dependent Variable Coefficient	t-ratio
EDUC1	-5.716	-1.363***	-0.394	-1.264
EDUC2	-6.850	-1.734**	-0.392	-1.336***
EDUC3	-8.029	-2.174**	-0.473	-1.727**
EDUC4	-7.237	-1.973**	-0.365	-1.342***
EDUC5	-9.218	-2.562*	-0.531	-1.986**
HRST	0.001	0.152	0.0004	0.404
$HRST^2$	-0.00001	-1.875**	0.000	-1.678**
IQTS	0.0001	0.424	0.048	0.040
(IQTS)(HRST)	0.0002	1.084	0.00001	0.771
Intercept	10.578		2.215	
R^2	0.309		0.208	
$\bar{R}^2$	0.267		0.162	
F	7.38		4.57	

*Significant at 1 per cent.

**Significant at 5 per cent.

***Significant at 10 per cent.

Furthermore, a direct influence on daily wage earnings through a simultaneous interaction between measured ability and number of hours of exposure to the vocational training course is verified though at a non-significant level. Accounting for measured ability as well as its enhancement through longer hours of vocational training courses have yielded quite a minimal improvement in the coefficient of multiple determination. Table 5 has further revealed that the R^2 has increased by less than one (1) per cent. However, adjusting the coefficient of multiple determination for the degrees of freedom has resulted into a slight improvement in the $\bar{R}^2$ of the DWAGE equation but a minimal decline of the $\bar{R}^2$ of the LDWAGE equation.

One of the direct implications of the study is the reiteration of the prime importance of educational attainment in the determination of wage earnings as well as the subsequent narrowing of wage earnings differential across the sources of labor inputs. By substracting the estimated regression coefficients of the category variables from the estimated intercept of the earnings function, one discovers a narrowing of the daily wage earnings differential as one rises in the hierarchy of educational-attainment categories. One possible implication of this particular finding is that employers' preferences still place a premium on educational attainment in the hiring of workers. It is quite intuitive to perceive of an employer who prefers a worker with a high level of schooling that is coupled with exposure in a skill-developing vocational training course than another worker with less schooling though equipped similarly with the vocational skills. More schooling enhances the marginal productivity of the worker holding other factors as constant.

7. Summary and Conclusion

The main objective of the paper is to examine the role of ability in the explanation of the variation in daily wage earnings. The seminal interest on the topic stems from the fact that the literature generally assumes measured ability as a component of the unexplained variations. Such a statement is more of an apology that is dictated significantly by the dearth of data measuring the theoretical construct. The scanty studies on the subject make use of the Intelligence Quotient test scores which are more predictive of school performance rather than wage earnings variations. In spite of this limitation, however, a direct relationship between measured ability and wage earnings is described conclusively from the several published studies. Such a direct relationship need to be verified further across types of occupational groups where policy interests may stress importance of the role of measured ability especially among the less-skilled and, hence, less-paid members of the work force. This paper is addressed to fill partially that gap in the empirical literature.

A recursive earnings function model is adopted in this particular exercise. In the first stage of the analysis, educational attainment and selected family background variables are hypothesized to influence the level of measured ability. The predicted value of measured ability is utilized thereafter as a regressor in the earnings function after satisfying the theoretical, statistical, and econometric criteria. The aptitude scores (in percentiles) together with individual socio-economic (including educational attainment) and vocational training program characteristics are hypothesized to influence the variations in daily wage earnings.

The OLS estimation method is used to calculate the parameters of the multiple regression equation using the actual value as well as the natural logarithm of daily wage earnings as measures of the dependent variable. However, the explanatory variables vary in their degree of contribution to the explanation of the total variance in the dependent variable. Hence, the forward selection technique is adopted in choosing the best set of explanatory variables. This method, which is premised on a sequential selection of the best regressor, treats the partial correlation coefficient and the adjusted R^2 as the statistical criteria. That is, given a set of n possible number of explanatory variables, then n "simple" regressions are estimated. The regressor that generates the highest partial correlation coefficient as well as $\bar{R}^2$ is selected as the best initial variable. Now, given the best initial estimated regression equation, then the $n-1$ remaining explanatory variables are each added to the initial equation resulting into a set of $n-1$ estimated multiple regression equations and the best equation is again selected using the established criteria. The same procedure is repeatedly applied and the limit to the sequential selection process is the highest adjusted $\bar{R}^2$ that can be obtained from the series.

The experience after undergoing the vocational training program, the size of the training class, and the level of educational attainment markedly influence the variations in daily wage earnings. Specifically, the length of the period in which the vocational trainee-graduates can apply into practical use his accumulated know-how from the vocational courses affect positively the level of daily wage earnings. Similarly, the increase in the size of the vocational class results significantly into a rise in the daily wage earnings.

The size of the class affords the trainees the opportunity to interact among themselves since (a) resources are limited, and (b) the nature of vocational instruction consequently implies such atmosphere of interaction, thus, accelerating the learning process. However, a determinate optimum can be deduced from the regression results since the findings show a decreasing daily wage earnings per unit trainee added beyond the optimum class size. The result of the inclusion of the level of educational attainment reiterates, furthermore, the economic attraction of a college degree. The findings of the study suggests that the labor market catering to this particular segment of the labor force still reacts positively and significantly to investment in human capital specifically in the form of a formal education. With respect to the number of hours of exposure in vocational training, although a positive relationship exists between the number of hours of training and daily wage earnings. The relationship is not statistically significant. The more significant relationship appears to be that of the significant decline in daily wage earnings per one hour rise in exposure to vocational training beyond an optimum level.

Evidence of wage discrimination in the labor market for vocational trainee-graduates due to sex differences is reflected in the study. The general observation that males receive higher monetary remuneration than females for labor services rendered is similarly noted in the study after controlling for the individual socio-economic and the vocational training course characteristics. Meanwhile, the average remunerations of certain occupational groups tend to be significantly comparable with that of the self-employed. Workers who are classified as beauticians, manicurists, dressmakers, tailors, and barbers register markedly a higher mean daily wage earnings than the self-employed. On the other hand, farmers significantly receive a lower average daily wage earning than the self-employed.

The inclusion further of the regressors measuring ability as well as its enhancement through longer hours of exposure in vocational training (on the assumption that the difference between aptitude levels measured before and after the vocational training program is minimal) has improved the capacity of the estimated multiple regression equation to account for the variations in daily wage earnings by less than one (1) percent only. The coefficients of the IQ test scores suggest a direct but insignificant relationship between measured ability and daily wage earnings. Similarly, the enhancement of measured ability through exposure in vocational training reflects further a direct and, again, insignificant influence on daily wage earnings.

The most consistent explanatory factor in daily wage earnings variation seems to be the length of time between the termination of vocational training and evaluation. At the outset of the paper, the variable is assumed to be a proxy measure for experience after the vocational training program. That is, the quality of work experience during the post-training period would be more enhanced given the added inputs that are absorbed from the nonformal training. On the other hand, the variable can be utilized as an indicator of search in the labormarket by vocational trainee-graduates. The improvement of labor skills through exposure in the vocational training program widens employment opportunities for vocational trainee-graduates. Note that the underlying motivation in undergoing the nonformal training may not only be the acquisition of new vocational skills but also the improvement of previously-acquired skills. According to an earlier description of the sample, a greater proportion of the vocational trainee-graduates who were employed after the vocational training have previous experience in the labor force before undergoing the training (see Inoferio, 1980). There would exist then some employers who would be willing to pay higher initial wage rates to individuals with the newly-acquired vocational skills; and, more so, if vocational trainee-graduates have attained higher levels of schooling prior to dropping out from the formal education stream. Therefore, one may classify the time length between the end of exposure to vocational training and evaluation as a search period for the vocational trainee-graduates. Hence, the longer the search period the higher the probability of finding an employer who is willing to pay the higher initial daily wage rate in a given labor market.

Less statistical significance can be extracted from the effects of length of exposure in vocational training as well as measured ability on the variations of daily wage earnings. One suspects that these variables would be more significant regressors of acquired vocational skills rather than daily wage earnings. Employers hire workers based on information that are available initially and which are indicative of skill levels (e.g., educational attainment, vocational training exposure). This statement deems to be appropriate since we are using (initial) daily wage as measure of the earnings variable. The influence of acquired skills as well as its determinants (i.e., number of hours of exposure to vocational training, average expenditure per trainee, measured ability) would be more significant when one uses a measure of wage earnings that would capture differentials in wage increases within a span of time. The reason behind this emphasis on an aggregate wage earnings measure is that variations in acquired skills can be translated into variations in productivity per worker. The average productivity of each vocational trainee-graduate who is working in the labor market differs and this would be reflected in the differentials in salary increases. This implies therefore a wage earnings variable that would capture the cumulative wage differentials within a given time period and the total wage earnings in a given time period would be an appropriate measure of the theoretical construct.

The study suggests initial evidences of acquisition and enhancement of skills through exposure in vocational training. This topic though should be subjected to an equally rigorous quantitative analysis. The present labor market still places a significant level of premium on the level of schooling rather than vocational training program inputs in the setting up of the (initial) daily wage earnings. This implies that a substitute for formal education as a criterion for employer's hiring decision at the entry point in the labor market does not exist. This is quite understandable since information on worker's skill level at that point is quite scarce. Thus, one can end this exposition by stating that the effects of inputs from vocational training plus the innate talent of the individual wouldbe realized in the course of his employment via his contribution to the firm's productivity which can be translated into total wage earnings differentials.

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Appendix A. MEAN AND STANDARD DEVIATION OF THE VARIABLES (n = 351 vocational trainee-graduates)

Variable	Mean	Standard Deviation
DWAGE	14.42	8.91
LDWAGE	2.48	0.36
AGE	30.43	12.29
AGE^2	1076.79	901.02
SEX	0.48	0.50
EDUC1	0.17	0.38
EDUC2	0.19	0.39
EDUC3	0.30	0.46
EDUC4	0.22	0.41
EDUC5	0.10	0.30
EDUC6	0.02	0.05
OCAT1	0.18	0.39
OCAT2	0.03	0.18
OCAT3	0.24	0.43
OCAT4	0.05	0.21
OCAT5	0.42	0.49
OCAT6	0.03	0.18
OCAT7	0.02	0.15
NDEP	0.22	0.80
CIVST	0.44	0.60
IQTS	59.99	18.39
STEMP	0.11	0.25
HRST	387.27	297.23
$HRST^2$	238070.88	400454.44
SIZEC	41.20	29.56
$SIZEC^2$	2568.69	4421.32
XPERT	145.62	73.53
MBGE	2.83	1.96

Appendix B. CORRELATION MATRIX

	DWAGE	LDWAGE	AGE	AGE^2	SEX	EDUC1	EDUC2	EDUC3	EDUC4	EDUC5	EDUC6	OCAT1	OCAT2
DWAGE	1.000												
LDWAGE	0.987	1.000											
AGE	-0.083	-0.118	1.000										
AGE^2	-0.082	-0.004	0.982	1.000									
SEX	0.177	0.073	0.100	0.097	1.000								
EDUC1	0.086	0.006	0.304	0.296	0.060	1.000							
EDUC2	-0.001	0.001	0.012	0.0003	0.138	-0.220	1.000						
EDUC3	-0.031	-0.022	-0.132	-0.115	-0.036	-0.300	-0.317	1.000					
EDUC4	0.005	0.052	-0.094	-0.081	-0.122	-0.239	-0.355	-0.343	1.000				
EDUC5	-0.110	-0.089	-0.046	-0.060	-0.046	-0.154	-0.164	-0.221	-0.178	1.000			
EDUC6	0.098	0.023	-0.043	-0.052	0.025	-0.065	-0.069	-0.093	-0.075	-0.048	1.000		
OCAT1	-0.124	-0.052	-0.344	-0.316	-0.458	-0.156	-0.173	-0.051	0.307	0.084	-0.014	1.000	
OCAT2	0.042	0.074	-0.096	-0.094	-0.057	-0.085	-0.091	-0.089	0.015	0.195	0.310	-0.089	1.000
OCAT3	0.278	0.258	-0.365	-0.325	0.432	-0.148	0.169	0.086	-0.035	-0.080	-0.080	-0.265	-0.106
OCAT4	-0.116	-0.134	-0.046	-0.061	-0.059	-0.032	-0.076	0.084	-0.054	0.099	-0.032	-0.106	-0.042
OCAT5	-0.179	-0.202	0.598	0.549	-0.0[illegible]5	0.268	0.082	-0.070	-0.172	-0.062	-0.081	-0.406	-0.162
OCAT6	-0.001	0.027	-0.022	-0.022	-0.025	-0.085	-0.051	0.117	0.053	-0.064	-0.027	-0.089	-0.035
OCAT7	0.132	0.088	0.013	-0.002	0.078	-0.034	-0.037	-0.049	-0.040	-0.026	0.531	-0.036	-0.14
NDEP	-0.001	-0.037	0.701	0.199	0.114	0.261	0.091	-0.069	-0.166	-0.072	-0.087	-0.327	-0.114
CIVST	-0.057	-0.091	0.695	0.224	0.210	0.313	0.124	-0.144	-0.206	-0.033	-0.042	-0.430	-0.187
IQTS	-0.150	0.222	0.368	0.334	-0.079	-0.091	0.031	0.054	-0.083	0.063	0.090	-0.360	-0.084
STEMP	0.100	0.093	-0.078	-0.087	-0.054	-0.044	-0.103	0.120	0.079	-0.079	-0.047	0.139	-0.027
HRST	-0.155	-0.116	0.415	0.331	-0.170	0.095	0.117	0.017	-0.164	-0.084	0.024	-0.376	-0.117
HRST^2	-0.166	-0.113	0.312	0.246	-0.210	0.010	0.114	0.021	-0.118	-0.043	0.025	-0.250	-0.088
SIZEC	0.041	0.002	0.436	0.871	-0.072	0.345	-0.010	-0.035	-0.212	-0.125	0.110	-0.324	-0.140
SIZEC^2	0.023	0.001	0.220	0.200	-0.104	0.247	-0.042	-0.038	-0.162	-0.093	0.259	-0.131	-0.088
XPERT	-0.122	-0.007	-0.298	-0.273	-0.252	-0.161	-0.008	0.126	-0.047	0.097	-0.028	0.264	0.015
MBGE	0.329	0.249	-0.049	-0.046	0.156	0.017	0.006	-0.015	-0.020	-0.032	0.117	-0.173	0.305

OCAT3	OCAT4	OCAT5	OCAT6	OCAT7	NDEP	CIVST	IQTS	STEMP	HRST	$HRST^2$	SIZEC	$SIZEC^2$	XPERT	MBGE
1.000														
-0.106	1.000													
-0.482	-0.194	1.000												
-0.106	-0.042	-0.162	1.000											
-0.042	-0.017	-0.065	-0.014	1.000										
-0.245	-0.058	0.499	-0.067	-0.011	1.000									
-0.248	-0.021	0.609	-0.060	0.065	0.655	1.000								
-0.020	-0.042	0.590	-0.029	0.067	0.275	0.396	1.000							
-0.151	0.055	-0.331	0.490	-0.034	-0.072	-0.117	-0.166	1.000						
-0.290	-0.102	0.652	-0.037	0.024	0.344	0.445	0.941	-0.169	1.000					
-0.256	-0.088	0.525	-0.049	-0.001	0.260	0.340	0.922	-0.160	0.969	1.000				
-0.355	-0.090	0.621	-0.044	-0.001	0.378	0.447	0.450	-0.116	0.536	0.419	1.000			
-0.240	-0.066	0.362	-0.038	-0.015	0.199	0.223	0.268	-0.087	0.331	0.246	0.871	1.000		
0.094	-0.036	-0.248	-0.134	-0.043	-0.219	-0.284	0.075	-0.026	0.076	0.167	-0.364	-0.243	1.000	
0.132	-0.170	-0.068	-0.063	-0.071	0.030	-0.029	0.220	0.099	0.221	0.290	0.065	0.054	0.056	1.000

Appendix Ca. REGRESSION RESULT USING DWAGE AS DEPENDENT VARIABLE WITH MEASURED ABILITY AS ONE OF THE REGRESSORS

Variable	Regression Coefficient	t-ratio
OCAT1	-0.549	-0.154
OCAT2	-4.951	-1.337***
OCAT3	4.418	1.584***
OCAT4	-2.480	-0.728
OCAT5	-3.787	-1.528***
OCAT6	0.008	0.002
MBGE	1.802	6.492*
HRST	0.001	0.152
$HRST^2$	-0.00001	-1.875**
SEX	1.590	1.379***
EDUC1	-5.716	-1.363***
EDUC2	-6.850	-1.734**
EDUC3	-8.029	-2.174**
EDUC4	-7.237	-1.973**
EDUC5	-9.218	-2.562*
AGE	0.137	0.667
AGE^2	-0.002	-0.687
SIZEC	0.190	4.176*
$SIZEC^2$	-0.001	-3.539*
IQTS	0.0001	0.424
(IQTS)(HRST)	0.0002	1.084
Intercept	10.578	
R^2	0.309	
$\bar{R}^2$	0.267	
F	7.38	

*Significant at 1 per cent.

**Significant at 5 per cent.

***Significant at 10 per cent.

Appendix Cb. REGRESSIONS RESULT USING LDWAGE AS DEPENDENT VARIABLE WITH MEASURED ABILITY AS ONE OF THE REGRESSORS

Variable	Regression Coefficient	t-ratio
OCAT1	0.063	0.238
OCAT2	-0.024	-0.088
OCAT3	0.380	1.853**
OCAT4	-0.196	-0.782
OCAT5	-0.271	-1.474***
OCAT6	0.084	0.326
MBGE	0.082	4.028*
SIZEC	0.012	3.549*
$SIZEC^2$	-0.0001	-2.919*
HRST	0.0004	0.404
$HRST^2$	0.000	-1.678**
SEX	0.136	1.592***
EDUC1	-0.394	-1.264
EDUC2	-0.392	-1.336***
EDUC3	-0.473	-1.727**
EDUC4	-0.365	-1.342***
EDUC5	-0.531	-1.986**
EXP	0.001	0.852
IQTS	0.048	0.040
(IQTS)(HRST)	0.00001	0.771
Intercept	2.215	
R^2	0.208	
$\bar{R}^2$	0.162	
F	4.57	

*Significant at 1 per cent.

**Significant at 5 per cent.

***Significant at 10 per cent.