

The effect of schooling, experiences, and firm size on earnings in Sri Lanka (Incorporated with the major emphasis of Mincer's Earnings Function)

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ABSTRACT:

This paper attempts to identify the effect of education, experiences and firm size on earnings in Sri Lanka incorporated with empirical emphasis of the Mincer's Earning Function. Since distinguished findings are reported pertaining to the log earning profile of education and experiences in literature, this study attempts to investigate, which kind of log earning profile is associated with education and experiences in Sri Lanka by adding a new variable "Firm Size" to the conventional Mincer's earning function. For this purpose, direct personal interviews with structured questionnaire survey were conducted to collect cross sectional data from 115 employees who are employing at firms in different sizes in Maspotha Divisional Secretariat Division of Kurunegala District. OLS Multiple regression analysis and Curvilinear regression techniques were employed as the major data analysis tools of the study. Results revealed by the study show that log-earning is a linear function of education ($R^2=34.5\%$) and a quadratic function of experiences ($R^2= 35.8\%$). Rate of returns to education (7.4%) was higher than the rate of returns to experiences (2.7%) which implies that the log-earning profile in the area is education oriented. Medium scale enterprises (20.1%) were identified as the most influential firm type on earnings. Overall, it shows that the firm size has a positive effect on earnings in the area. Homogeneous preferences on education stimulated by the provision of free education were identified as the reason for linearity of education while deterioration of skills with declining physical and mental effort with growing age were reasons for the concavity behaviour of experiences. Further investment on education, taking wage policies of firms into consideration and forecasting future expectation of firms in the job market will lead to increase rate of return on the investment of education and experiences.

Keywords: Education, Experiences, Firm size, Earnings

INTRODUCTION

Education and potential experiences are major pillars of individuals' earnings, discussed in Mincer's earning function. Growing concern on human capital development over physical capital-oriented production process shift the intention of scholars to conduct research from the quantitative aspect of life to the qualitative aspect where investment on human capital is highlighted in all four corners of the world. Reporting distinguished empirical findings in literature, inspired scholars to extend the scope of Human Capital Investment Model(HCIM) in a wider context with several amendments in different time spans. Among those existing studies, critical questions raised by the scholars were "*whether log earnings are either linear or quadratic function of schooling and whether the earnings exhibit linear or quadratic behaviour with potential experiences gained in the labour market*". By the passing of time, it shows that apart from education and experiences, individuals' earning (in terms of wage) has an effect from outside factors which are beyond the control of individuals. In such a factor, firm size has been identified as an important factor

that affects individuals' earnings over education and experiences in terms of years. Therefore, this study focuses on identifying the effect of education, experiences and firm size on individual's earning in Sri Lanka incorporated with major emphasis of Mincer's earning function.

Moving back to the evolution of Mincer's earning function it goes back to 1958 where Mincer shows that earnings of individual's is a function of schooling and experiences. Since this initiation was challenged and accepted by several scholars, Mincer then introduced a well-known earning function which is called "human capital earnings function" in 1974 where he revealed that log earnings are a linear function of education and quadratic functions of experiences. In a year back, Becker (1975) posits that marginal returns to schooling can be either an increasing or decreasing function of earnings and which creates a heated debate among scholars to examine the linearity of earning function affected by its major constructs, education and experiences. In such a time path, Katz and Murphy (1992) stated that earnings-schooling profile is convex since it exhibits increasing return to education while linear approximation may be possible only with a stable environment. As a response to these existing findings incorporated with earning function, Mincer (1997) conducted new research to confirm the existing relationship of education and experiences on earning function, where he found that average log earnings may either be a convex or a concave function of education because of the existing heterogeneous preferences and variety of earnings opportunities available for individuals in the existing labour market.

In contrast to nonlinear earning-education profile, a series of empirical studies indicate that earning-education profile is linear rather than either convex or concave in shape. Starting from the simple log earning education profile, Mincer (1958) posits that log-earnings are the linear function of education. Adhering to these findings, Park's (1994) witnessed that the linear schooling is best fitted with the data set than a quadratic form of log earnings education profile. Similar to this finding, Card's (1999) also revealed that the earning-schooling profile is typically linear except the group for men who completed 11-12 years of schooling.

When it moves to the experiences which is the next important variable in Mincer's earning function, several authors pointed out that earning-experiences profile is a quadratic or parabolic function of experiences. For example, Polachek's (2007) shows that, dollar earnings profiles are a parabolic function of years of experiences while, Rupert et al (1996) also confirmed the concavity of the log-earning-experiences profile throughout their empirical findings.

Apart from education and earnings, existing literature shows that firm characteristics are playing a major role by influencing individuals' wages. The impacts of firm's characteristics on wage differentials set about the mid-20th century since the scope of wage differential was mainly focused on demand side factors in analysis (Romaguera, 1991). Along with the same scope, this emphasis has been expanded later by several scholars (Lester, 1967 and Stigler, 1962) posit that large firms relatively spend a higher cost of recruiting workers. In such an investigation, it shows that large industries tend to pay high wages in recruiting the productive workers since they are essential to adapt with modern technology in future production process (Weiss, 1980; Salop, 1979; Stiglitz, 1986 & Qu, 2015).

Since the distinguishing behavior of education and experiences on earnings reported in literature and firm size has been identified as an important pillar as same as importance of education and experiences this study attempts to answer the following research questions in Sri Lankan context.

- Whether the firm size has affected to increase wages or not and which type of firms contribute more on earnings?
- Whether the log-earning-schooling profile is linear or quadratic?
- Whether log earning- experience profile is linear or quadratic?

LITERATURE REVIEW

The neoclassical theory articulated that decision on labour demand by rational firms depended on marginal productivity of labour, hence wage differential is basically associated with the matter of productivity. In a free market scenario, it assumes that laborers with the same quality (homogeneous) are paid the same wages. The remarkable changes that shifted in the emphasis on wage differential, from demand side to supply side with the invention of the human capital model. According to Schmidt & Zimmermann (1991) emphasis, though numerous models exist with various predictive power, each of them are only dealing with a single aspect of earnings distribution, where only one theory has significant power to explain all these patterns simultaneously, that is the human capital investment model (HCIM).

Prior to the Mincer's emphasis of this HCIM, the empirical findings show that concave growth of earning is a function of age. However, this relationship was debated by many researchers later on since the relationship between earnings and age is different (different rate of return) with different age groups. In line with this empirical evidence, Mincer (1958) posits that log earnings cannot exist as a strictly separable function of age and schooling; hence experiences were introduced instead of age as a new variable into the model to merge this inseparable problem of age and schooling. This work enables us to identify the shape and slope of the age-earning profile of different education groups. This emphasis of Mincer's equation provides the foundation for many researchers to estimate the causal relationship between education and earnings (Card, 1999). That is why even after five decades these three variables, schooling, experiences and earnings are typically popular in many studies to estimate the earning regression.

The most widely used of Mincer's earning functions presented in 1974 (usually used as "human capital earnings function") which states that log earnings ($\ln Y$) are the linear function of years of schooling (S) and quadratic functions of years of experiences (X). This relationship revealed by Mincer (1974) is shown in equation 01 as follows.

$$\ln(\hat{Y}) = \ln(\beta_0 Y_0) \pm \beta_1 S \pm \beta_2 X \pm \beta_3 X^2 + e \quad \text{--- (01)}$$

However, the empirical estimations incorporated with this model were distinguished in different aspects and differed by countries while this difference findings have been explained as a thematic approach as in the following section.

Whether Earnings are best fitted with dollar value or natural log?

In most of the human capital investment models, earnings (as the dependent variable) are typically measured by hourly or weekly terms. However, the matter about which earnings are concerned is often determined and depends on the necessity of study since some data sets are available as annual earnings while others are available on a weekly or hourly basis (Card, 1999). In that sense, researcher has a freedom to determine which data are appropriate based on the time frame and other stuff that are expected to accomplish throughout the study.

Another important aspect of the human capital investment model is that, either the earning is best fitted with log values (natural logarithm) or dollar values. In this case, Box & Cox (1964) findings are important, where they found that log-earnings yielded a stronger statistical fit for the HCIM with years of schooling and experiences than dollar earnings (dependent variable). Similar to this, Mincer (1974) pointed out that, though some empirical analyses had used the dollar value of earnings as a dependent variable in their study, he found it fault with misspecification. Apart from that, Hilmer (2021) also revealed that if the dependent variable is a dollar amount, then the log linear model of earning is best fitted with the data set, unless there is no any zero value for earnings. Along with all these findings asserted that, using log earnings is best fitted

than dollar values of wages as the dependent variable for earning function.

Next this discussion moves to discuss the most debated matter that, whether the log earnings is a linear function or quadratic function of schooling in nature.

Whether the log-earning-schooling profile is linear or quadratic?

The importance of schooling on earnings was highlighted by Mincer through his series of researches on estimating earning function where he posits that rational individuals invest on human capital with the expectation of maximizing present value of future earnings over his/her lifespan. This linear relationship between education and log earnings are shown in the following equation.

$$\ln(y) = \ln y_0 + rS + e$$

where r is the parameter which refers to the rate of return from additional years of schooling(S).

In the basic model of Mincer's earning function, log earnings is identified as a linear function of education, proxied by years of schooling (YoS). In a simple HCIM, log earnings for all groups depict a concave behavior, meaning that the return to schooling declines as increases of years of schooling when the individual's preferences are heterogeneous. Incorporated with a Becker (1975) type model which yields a hedonic equilibrium, implies that marginal returns to schooling can be either an increasing or decreasing function of earnings. Later on, Katz and Murphy (1992) found that the linear approximation may only be accurate in a stable environment. As a consequence of an unstable economic condition (where relative supply did not increase enough to match the growth in relative demand after 1980s), Katz and Murphy (1992) found that the return to education shows an increasing trend and hence it typically shows the convex earnings-schooling profile. In contrast to these findings, Card and Krueger (1992) based on the unrestricted earning function revealed that log earnings is a linear function of schooling except 15-16 group while it is also confirmed by the insignificant coefficient of quadratic term. Opposite to this idea, Heckman et al. (1996) proved that log earnings are the nonlinear function of schooling because of the high rate of returns earned by 15 and 16 years of schooling. By upgrading the research scope with new data, Mincer (1997) revealed that average log earnings may either be a convex or a concave function of education since individuals' preferences are heterogeneous and a variety of earning opportunities are available. Since most of the literature is supported with a quadratic form of log earning education profile, the following hypothesis is constructed to assess the behavior of log earning-schooling profile in Sri Lanka.

H₁. Log earning is a quadratic function of schooling.

Whether the log earning-experiences profile is linear or quadratic?

Apart from education, the next important variable in the Mincer's earning function is "experiences" which is typically approximated by subtracting years of schooling (YoS) plus 6 years from age ($Exp = Age - (YoS + 6)$). Due to this approximation, empirical evidences show that experiences and schooling are negatively correlated typically with cross sectional data. In Mincer's views on experiences, He emphasized the importance of including *experiences* in earning function, because omitting *experiences* or *experience-squared* term leads to underestimate the coefficient of schooling due to two reasons. One is the negative correlation between the experiences and schooling and the other one is the positive effect of schooling and experiences on individuals' earnings. Similarly, Polacheck (2007) also confirmed this finding and pointed out that omitting experiences from the model is not applicable in estimating earning function. Therefore, adding experience to the earning function is identified as an essential requirement in illustrating a realistic effect among its major attributes earnings, schooling and experiences.

Another important emphasis regarding the log earning-experiences profile is that earning was typically a quadratic function rather than linear function of potential experiences. In the Human capital model with including experiences, Mincer (1974) found that rate of return to experiences decline over time. The negative sign of quadratic term implies that people with higher education have less experiences in terms of years even among the same aged group. By reviewing this emphasis, we formulated the following hypothesis.

H₂: Log earnings are the quadratic function of potential experiences gained in the labour market

Whether the firm size has an effect on changing individuals's earnings

Apart from schooling and experiences, firm characteristics have been identified as an influential factor on worker's earnings. Recalling the efficiency wage theory which implies that firms are better off by paying wages plus incentives that are set above the market clearing level in order to minimize labour turnover or deter shrinking. This theoretical emphasis could be seen in practice in the real world. That is why most of the managers intend to pay high salaries with the purpose of retaining productive workers with them and minimize the cost of labour turnover. In this scenario, the estimated coefficient of experiences through the log earning-experiences profile is important to determine the effective wage rate rather than the wage rate determined in the free market scenario.

Moreover, Schumpeter Hypothesis implies that larger firms are more innovative where they expect well qualified workers hence have to pay higher wages. Align with this theoretical emphasis, Qu (2015) explicated that large firms are paying high salaries for keeping laborers with innovative mind and skills with them. Moving towards the emphasis of the competitive hypothesis which explains the trending paying behavior of modern firms during the period of 1975-1986 where it witnessed that modern firms pay wages substantially higher because of higher opportunity cost on trained /skilled workers if they left the firm. Similarly, findings of the study conducted by Freeman & Medoff (1981) revealed that increase in firm size has an effect on increase in wages of both unions as well as non-union workers in the USA. Apart from that, Dunn (1986) has also confirmed this positive relationship between firm size and wages through his analysis. Moreover, Strands (1987) witnessed that firm size has a positive effect on earnings because productive firms, being a larger size, need to maintain a larger stock of labour to survive in long run equilibrium, hence they tend to offer higher average wages than small firms.

Later on, the study conducted by Schmidt & Zimmermann (1991) verified the prevailing relationship among firm size, wages and work characteristics in Germany. By adding a new variable "firm size", they investigated the exhibited relationships between other exogenous factors (years of schooling, experiences, engage in multiple jobs) and endogenous variable (measured through the log value of monthly income). Since the log-earnings are a quadratic function of experiences, they employed quadratic form for identifying the possible nonlinear effects of experiences. Their findings show a positive relationship between wage and firm size, because firms are compelled to pay higher wages to attract quality labour as large firms do it. In resent, Patrinos (2016) emphasized that apart from the level of education and heterogeneities of skills, paying attention to firms' size, institutional policy, and obligated contracts are important in equal weight in the analysis of wage differentials. Since considerable efforts on empirical studies witnessed the positive relationship between firm size and earnings we construct the following hypothesis;

H₃: Firm size has an effect on individuals' earnings

Along with these hypotheses and concerning the gap of literature following objectives are expected to achieve throughout this study.

OBJECTIVES

Main objective

- To identify whether the major emphasis of Mincer's earning function and other empirical emphasis on earning determination is valid in Sri Lankan context or not.

Specific objectives

- To examine whether the log-earning-schooling profile is linear or not in Sri Lankan context
- To investigate whether the log-earning is a quadratic function or not in Sri Lankan context
- To identify whether the firm size has an effect on earnings and which firm type is the most contributed firm type on changing wages in Sri Lanka.

METHODOLOGY

This study was conducted in Kurunegala district since it reflects the mixed socioeconomic backgrounds in Sri Lanka in 2021. Since most of the business activities are fairly centered to the city centers and it shows that the fair distribution of all the firm types in the area, Maspotha Divisional Secretariat was purposely selected as the study area of this study. All the firms which registered under 12 categories are concerned as the population while paying attention to the minimum sample requirements (10%), 115 firms were selected by employing a stratified sampling technique. In the process of free test, 10 questionnaires were filled and based on that, the questionnaire was updated with the necessary changes particularly by adding the self-employment firm type which used in the analysis as a reference group pertaining to the firm type. Finally, by distributing structured questionnaires and direct personal interviews cross-sectional data were from 115 employees who represents a five type of firms (which classified based on the OECD classification, 2016) to identify the effect from education, experiences and firm size on earnings incorporated with the major emphasis of Mincer's Earning function. OLS Multiple regression and Curvilinear regression methodologies were used to analyze the data to identify the existing log earning profile in Sri Lanka.

Along with the established objectives of the study mentioned above, this section refers to discuss the results which derived from the descriptive and inferential analysis based on the cross sectional data collated from the study area.

Descriptive statistics

Prior to discussing the casual relationships among variables exhibited in the study, it is important to discuss the important features of the dataset since the validity of results depends on the accuracy and the inherited characteristics of the selected sample. Therefore, incorporated with basic statistics measures such as mean, maximum, minimum, kurtosis, skewness values etc., here we analyze the important characteristics and sample distribution are analysis according to earnings, education, experiences and firm size related to a data derived from a sample pertaining to the study area.

Sample distribution according to the age was ranged from 18 to 74 years old while average earnings was approximately at Rs. 70,000.00 per month though it ranged from Rs. 30,000.00 to Rs. 214,000.00 in the sample. Compared to the male (54.8%), female representation of the sample was 45.2% in the area which implies the minimum gender inequality among the employed population. Average years of experiences gained through the labor market after schooling was 21(21.42) years while average education level in

the sample was (11.05) passed grade 11 (GCE O/L) and 25 % among them have completed post graduate

degrees.

Relating to the basic statistics measures, we show that all the data pertaining to selected variables in the model are positive and fluctuating in a desirable range with standard skewness ($-1 < \text{Skewness} < +1$) and kurtosis value (nearly +3). However, most of the variables show a platykurtic distribution since most of them are varying near to 0. Since it seems that all the rupee value of monthly wages are ranged as positive values, log values for monthly earnings could be able to apply since it was an essential requirement for constructing the dependent variable according to the Mincer's emphasis.

When it moves to analyze the result revealed by the Correlation matrix, It shows that education (0.587) and firm size(MSE 0.367) are positively correlated with earnings while education is the most influential factor affects on earnings (under 5% significant level) in the study area. Exceptionally we show that experiences (-0.374) gained by workers is negatively correlated with earnings. This is due to two reasons. First, the number of people who are with long experiences by years, are older compared to the younger. Second, declining physical and cognitive fitness in old aged has an effect on declining earnings. Regarding the firm size effect on earnings, only Micro enterprises ($p=0.022$) and Medium Scale Enterprises ($p=0.00056$) were significant. Among these types of firms, we show that MSE(0.367) is positively correlated with earnings implies that if someone who has employed in MSE which leads to increase their wage with compared to the other firm categories. In Contrast to this, negative correlation between Micro enterprises and earnings(-0.10) implies that with compared to the other firm types, if someone who employed in MEs, leads to earn a less salary than other firms' types. Though the small-scale enterprises show a positive correlation (0.082) and large-scale enterprises shows a negative correlation with earnings, both of them variables were not significant to explain the changes of earnings under 5% significant ($p < 0.05$) level. Gender and Interaction terms (which explain the combined effect of schooling and experiences-YoST) were insignificant to explain the changes of earnings, therefore we omitted those four variables in the regression. However, experiences(EXP) and experiences squared (EXP^2) term are included in regression though it suffered from the issue of multicollinearity due to high coloration coefficient(0.947) between them. The negative coefficient (-0.143) of the interaction term (YoST) implies the apparent convergence of earning-experience profile. In statistical literature advise us to ignore it as an issue for conducting multiple regressions/curvilinear regression with product terms(Disatnik & Sivan, 2016), where we compute the squared value based on the variable itself hence the assumption that avoiding multicollinearity among different independent variables do not violate here.

After completion of the discussion pertaining to the sample distribution of data with its special features and results of the correlation matrix, next we move to conduct the Ordinary Least Square (OLS) Multiple regression analysis/curvilinear regression analysis to investigate the existing relationships among the major attributes of HCIM with adding the new variable, *firm size*.

Relating to the assumption in regression analysis, we show that the dependent variable is normally distributed and all the data in the regression are scale measurements. Independent variables need to be free from the issue of multicollinearity is another assumption in conducting OLS multiple regression analysis. Statistically, the degree of multicollinearity among the variables are measured through the Tolerance value (it should be > 0.1 for better results) or Variance Inflation Factor(VIF should be < 10 for better results) (Gignac, 2021). As mentioned above, in conducting regression like curvilinear regression, multicollinearity values are not trustworthy and they are misleading. The reason is that if multicollinearity is higher than the expected VIF value (eg.12.55), then the standard errors relate to the unstandardized beta weights should be larger than the real value mentioned in the coefficient table which may very tiny unstandardized standard error. Therefore, multicollinearity (VIF value > 10) is not an issue in regressions with product terms, such as moderated or curvilinear regression (Disatnik & Sivan, 2016).

Therefore, in this model our study is free from the issue of assumption pertaining to multicollinearity.

RESULTS AND DISCUSSION

By focusing on the established objectives of the study this section refers to explain results revealed by the regression analysis, derived based on above mentioned methodologies.

H₁: Log earnings are linear function of education.

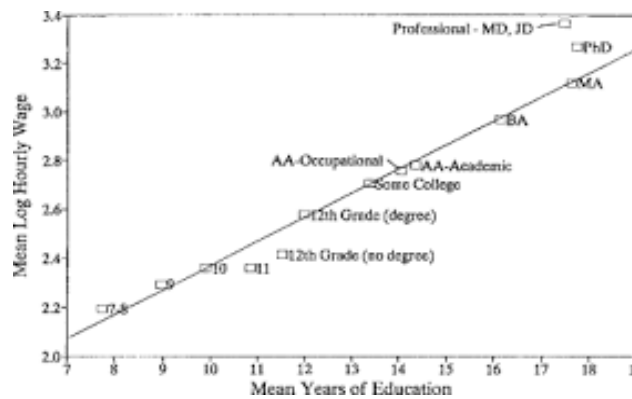
In a comparison of R^2 values pertaining to the linear and quadratic function itself, our findings show that individuals' earnings is best fitted with a linear function rather than a quadratic function of schooling. Though earnings are explained by a quadratic function compared to the linear function by a very tiny changes of by R^2 (0.3%), in terms of standard error which was higher with quadratic function rather than Linear function of schooling. Relating to the F test value (which explains the degree of overall model fittings) it was desirable with linear function rather than with the quadratic function. Based on these findings, it revealed that our data set pertaining to the study area is best fitted with the linear function of schooling rather than quadratic function (see results mentioned on table 2.), while our finding is similar to the early estimates of Mincer's earning function and other scholars (Park's, 1994; Card, 1999; Card and Krueger, 1992).

Table 2. Log earning-schooling profile				
Equation	Model Summary			
	R Square	AR ²	Sts. error	F
Linear	0.345	0.339	0.294	59.47
Quadratic	0.348	0.336	0.295	29.86
Dependent Variable: $\ln Y$, The independent variable: Yos, YoS^2				
Source: Author calculation (2021)				

Years of schooling are varied among countries in different education streams where return to investment depends on the student's preference on university, college or some time shift it from education to work. The homogeneous preference of individuals on education as a consequence of provision of free education for all, up to the university graduation, and preferences being varied after the university graduation mostly is identified as the reason for the linearity of education in the selected area. It is depicted by the figure 3, where there is a marginal decline up to the graduation (inflection point 17.73) and thereafter it begins to increase at an increasing rate though the changes are small compared to the linear approximation of the return to schooling at all.

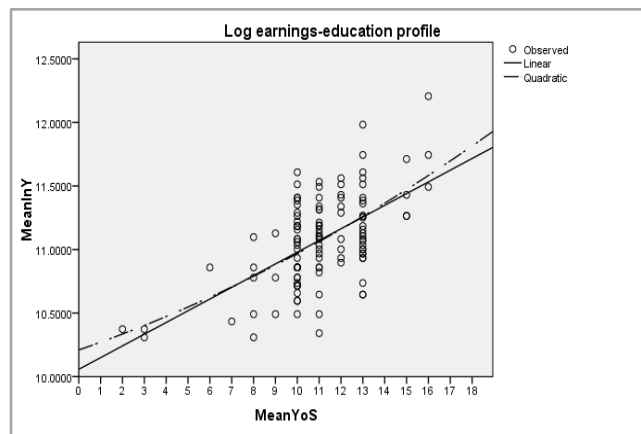
Our finding is somewhat similar to Park's (1994) findings where he witnessed that linear schooling is best fit with the data set than a quadratic form of log earnings education profile. In addition to this, our findings also tally with the Card's (1999) findings. According to him, apart from men who have completed 11 or 12 years of schooling, the earning-schooling profile was typically linear. The Causal Effect of Education on Earnings revealed by his study and our results are shown in the following figure 2 and 3 respectively.

Figure 2: Causal Effect of Education on Earnings



Source: Card (1999 p.1807)

Figure 3: Log earnings-education profile



Source: Author Calculation (2022)

H₂: Log earnings are a linear function of experiences

As opposed to the education, results revealed by the curvilinear regression analysis show that log earning-experiences profile is well fitted with quadratic function ($R^2=0.358$) rather than linear function (see table 3). Even in terms of standard errors which are less in quadratic function than it is with the linear function.

Table 3. Log earning-experiences profile				
Equation	Model Summary			
	R Square	AR ²	Sts. error	F
Linear	0.140	0.132	0.337	18.39
Quadratic	0.358	0.346	0.292	31.22
Dependent Variable: <i>lnY</i> , The independent variable: <i>EXP</i> , <i>EXP</i> ²				
Source: Author calculation (2022)				

According to the regression coefficient of simple logearning-experiences profile, b_1 (EXP) represents an upward linear trend in the value of Y along the X axis while b_2 (EXP^2) represents the downward linear

trend of data. This means that slope initially increases when years of experience increases but thereafter it begins to decrease with any increases of EXP by each additional year.

Table 4: Curvilinear regression coefficients (experiences)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Experiences (Years)	.032	.007	1.217	4.525	.000
Experiences (Years) ** 2	-.001	.000	-1.658	-6.166	.000
(Constant)	10.927	.077		141.773	.000

Source: Author calculation (2022)

The estimated return to experiences is 3.2 percent which implies that when years of experiences increase by a year until 20 (inflection point is 19.67) years of experiences, earnings increase at a rate of 3.2 percent. While the negative value of the quadratic term explains that after gaining 20 years of experience, then any additional increase in experiences in each year leads to decrease individuals' earnings by 0.1%.

Our finding is similar to Polachek's (2007) findings, that dollar earnings profiles is a parabolic function of years of experiences. Similarly, our finding on experiences is also tallied with the findings of Rupert et al (1996) with cross-sectional data. According to them concave shape of earning-experiences function is typically possible because of two reasons. One reason is that people who have more experiences are usually older and less educated than younger people while another reason is, individuals' skills decline over their lifespan.

H₃: Firm size do not affect on individuals' earnings

Whether the firm size has an effect on log earnings or not in Sri Lanka is the most important contribution to the new knowledge throughout this study. In such an initiation , we found that only Medium Scale Enterprises (MSE) has contributed to increasing individuals' earnings in the area. Simply it means that, if someone who employs in Medium Scale Enterprises has a considerable effect on changing (increase) wages compared to employing in other firm types in the area. Though Micro enterprises and medium scale enterprises have a considerable effect on changing the earnings of individuals in the area in correlation matrix, in a regression analysis only medium scale enterprises are significant to explain the changes of earnings. Apart from that, our findings show that, coefficient of small scale and large-scale enterprises are not significant (p=0.914) to explain the changes of earnings in the study area.

MINCER'S FUNCTION EXTENDING WITH ADDING FIRM SIZE

The major objective of this study was to identify the impact of firm size with other human capital attributes (discussed in the Mincer's standard earning function) on earnings of individuals in Sri Lanka. As other scholars revealed, here we also show that the data set is fairly fitted with the most familiar Mincer's (1974) equation to explain the changes of earnings. The fitted model is shown by table 5.4, and the reliability of the fitted model has been evaluated throughout the standard statistics terminologies such as R², AR², F-test and other ANOVA properties(see the table 5.2 and 5.3).

Table 5.2: Model Summary

Model	R	R Square	Adj. R Square	Std. Error of theEstimate	Durbin-Watson
1	.775 ^a	.601	.582	.2336693	1.139

a. Predictors: (Constant), Medium Scale Enterprises, YoS, Micro Enterprises, Exp2, Experiences (Years),
b. Dependent Variable: lnY

Source: Author calculation (2022)

As shown on table 5.2, coefficient of determination (R^2 value) is 0.601, which implies that changes of earnings (dependent variable) is explained by 60.1% from the selected independent variables in the model. The marginal difference between R^2 and adjusted R^2 (AR^2) value (1.9%) means that independent variables we have employed in the model adequately explain changes of earnings of individuals in the study area. F statistics figure was 25.69, which allowed us to reject H_0 and accept alternative hypothesis (H_1) since the p value for F statistics is less than 0.05, which means that overall, the statistical regression analysis is statistically significant (see Table 5.3).

Table 5.3: ANOVA^a

Model	Sum of Squares	df	Mean Square	F	Sig.	
1	Regression	5.236	7	.748	25.692	.000 ^b
	Residual	3.115	107	.029		
	Total	8.352	114			

a. Dependent Variable: lnY, b. Predictors: (Constant), Medium Scale Enterprises, Experiences (Years), Micro Enterprises, YoS, Small Scale Enterprises, Exp2, YoST

Source: Author calculation (2022)

After ensuring the fitted model is statistically significant, the results revealed by the OLS multiple regression analysis is shown on the table 5.4.

Table 5.4: Regression Coefficients of estimated Model

Variable	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	10.03	.142		70.808	.000		
Education (YoS)	.074	.010	.470	7.275	.000	.877	1.140
Experiences (EXP)	.027	.005	1.014	5.184	.000	.096	10.438
Exp2	-.001	.000	-1.249	-6.484	.000	.099	10.130
Micro Enterprises (ME)	.006	.058	.007	.108	.914	.820	1.219
Medium Scale Enterprises(MSE)	.201	.057	.236	3.519	.001	.813	1.230

Dependent Variable: lnY

Source: Author calculations (20212)

Results shown in table 5.5 implies that, education has an significant and positive effect on increasing earnings of the individual's in the area. While our finding is similar to Gabriel and Schmitz (2005). As per referred to the regression coefficient, earnings increase by 7.4% as years of schooling by a grade/year when remaining other factors employed in the model are remaining constant. Homogeneous preference on education affected by free education from kindergarten to university education has been identified as the reason for the linearity. Higher magnitude of regression coefficient of YoS over Exp coefficient, revealed that education is still playing a vital role on earnings of individuals over experiences in Sri Lanka.

The negative coefficient of the interaction term (st) implies the apparent convergence of experience profiles against log earnings in the area. Though we employed an interaction term to identify the combined effect of education and experiences it was not significant, hence we omitted it from the final regression estimation. Since the quadratic term relates to experiences was negative, log-earning is identified as a concave function of experiences. This concavity behaviour explained in the regression, implies that earning increases on average by 2.7% during the first 13.6 (inflection point 13.5) years and then it begins to decline as increase in experiences by a year as a consequence of incurring cost over its return. Our finding is similar with Mincer's (1974) findings which explains the consistency of concavity of experience-earnings profile. In addition to that, our findings also tally with the Schmidt & Zimmermann (1991) they show the positive effect of experiences on earning.

By assuming that firm size and years of schooling are remaining constant, then the rate of return to experiences is explained by its marginal effect can be calculated as follows;

The marginal effect of experiences (ME_{exp}) on earnings at 10 years of experiences, evaluated at 9 is;

$$ME_{exp} = \frac{\partial \ln Y}{\partial exp}, \quad ME_{exp} = 0.27 - 2(0.001)exp$$

The marginal effect of experiences;

- on earnings at 1 years of experiences, evaluated at 0 is = 2.7%
- on earnings at 2 years of experiences, evaluated at 1 is = 2.5%
- on earnings at 14 years of experiences, evaluated at 13 is = 0.1%
- on earnings at 15 years of experiences, evaluated at 14 is = -0.1%

Based on the above results, it shows that marginal return to experiences increases but at a decreasing rate up to gaining the experiences in years by 13.6 months, and then it reflects the diminishing return with increase in each additional year in job training, when all other factors remain constant.

Moving to analyze the firm size effect on earnings, it shows that on average, earnings are 20.1% higher in medium scale enterprises than Self-employment business. The effect of Micro enterprises on earnings was marginal at 0.6%, however it was insignificant. Compared to the reference group (self-employment business without having any additional paid worker), it seems that earning increases with the firm size except the effect from large scale enterprises because it was also insignificant in the given significant range ($P < 0.05$). Our finding was similar to Gerlach (1998) and Strands (1987) findings where they have also verified the positive relationship between wages and firm size.

Most of the enterprises belonging to MSEs reported in this survey included shopping malls, private hospitals and a few garment factories. Compared to SME and ME, it shows that they are looking at younger workers related to the available nature of jobs with them and it was easy to train youngsters since their high adaptability to job tasks within a short period of time compared to elders. Since the benefits of training

younger workers are long lasting against its cost on training is another factor of paying high wages by the MSE compared to other types of firm.

CONCLUSIONS

Incorporated with the Mincer's earning functions, this study attempts to identify the effect of education, experiences, and particularly the firm size on an individual's earnings with special reference to the Kurunegala district in Sri Lanka. As a contribution to the new knowledge, this study attempts to test the validity of major attributes of Mincer's earning function in Sri Lankan context by adding firm size as a new variable. Since it shows that firm size as an external factor which is beyond the control of workers compared to other variables education and experiences included in Mincer function, this study makes an effort to investigate how different types of firms make an influence to determine the wages compared to the schooling and experiences. For this purpose, cross sectional data were collected from the 115 respondents through direct personal interviews and by distributing structured questionnaires in the Maspotha Divisional Secretariat based on the list of Registered commercial places issued by DSDs and then classified them into firms' size based on the OECD classification. OLS multiple regression and Curvilinear regression analysis techniques were employed to identify the causal effects of education, experiences and firm size on earnings by paying special attention to whether the log earning profile is a linear or quadratic function of education or experiences.

Results revealed by the study show that firm size has a positive effect on increasing wages than other two factors: education and experiences relevant to the study area. Among four types of firm sizes, medium scale enterprises(MSE) is the only firm type which has a significant and positive effect on earnings in Sri Lanka. Regression coefficient of MSE implies that on average 20.7 % increase in wages of the person if she or he has employed in medium scale enterprises compared to the self-employment business in the study area. Though the Micro enterprises showed a positive marginal effect on wages, either it or any other firm types (except MSE) were not significant to explain the changes of earnings. However along with the four firm types in size, it revealed that earning is tend to be increased with firm size from Self-employment to Medium scale enterprises, In that sense our findings are similar to the finding of Gerlach, (1998) and Schmidt & Zimmermann (1991) which revealed the firm size has a positive effect on earnings.

When it moved to discuss the results pertaining to education and experiences, log earnings was identified as a linear function of education while a quadratic function of experiences. The estimated coefficient for education was (7.4 %) which is higher than the coefficient of experiences (2.7%), which implies that the rate of return associated with years of schooling is greater than the experiences in the job market. The linearity of education is resulting due to the homogeneous preferences of majority workers with the experiences of free education up to the graduation. The coefficient of experience-squared term was negative as similar to the Mincer's (1974) standard human capital earnings function, which implies that the consistent or concave shape of experience-earnings profile empirically resulted from declining physical and mental efforts of workers with growing age.

Overall, Firm size and education are playing a considerable role in increasing earnings. Therefore, identifying the association between education and firm size and creating a bridge between those two will be able increase the rate of return related to education & firm size on earnings. Another important finding throughout this study is, experiences were not much important compared to firm types or education on increasing the earnings. Hence it implies that potential experiences gained from the labor market do not equally tally with when an employee moves to one from another employment though the experiences gained from the previous job is not equally important for the current job compared to the level of education. In addition to that, wage policies of a firm are identified as more influential factors than schooling and training experiences. Further investment on education, taking wage policies of firms into consideration and

forecasting future expectation of firms in the job market will lead to an increased rate of return on the investment of education and experiences.

REFERENCES

1. Becker, G. S. (1975). Investment in human capital: effects on earnings. In *Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Education*, Second Edition (pp. 13-44). NBER.
2. Box, G. E., & Cox, D. R. (1964). An analysis of transformations. *Journal of the Royal Statistical Society: Series B (Methodological)*, 26(2), 211-243.
3. Card, D. (1999). The causal effect of education on earnings. *Handbook of labor economics*, 3, 1801-1863.
4. Card, D., & Krueger, A. B. (1992). Does school quality matter? Returns to education and the characteristics of public schools in the United States. *Journal of political Economy*, 100(1), 1-40.
5. Disatnik, D., & Sivan, L. (2016). The multicollinearity illusion in moderated regression analysis. *Marketing Letters*, 27, 403-408.
6. Dunn, L. F. (1986). Work disutility and compensating differentials: Estimation of factors in the link between wages and firm size. *The review of Economics and Statistics*, 67-73.
7. Freeman, R. B., & Medoff, J. L. (1981). The impact of the percentage organized on union and nonunion wages. *The Review of Economics and Statistics*, 561-572.
8. Gabriel, P. E., & Schmitz, S. (2005). A note on occupational variations in the returns to education in the US labor market. *International Journal of Manpower*.
9. Gerlach, K., & Hübler, O. (1998). Firm size and wages in Germany—trends and impacts of mobility. *Empirica*, 25(3), 245-261.
10. Gignac, G. E. (2021). How2statsbook (pp. C16. 12-C. 16.13, Online Edition 1). Perth, Australia: Author. Retrieved on, 5.
11. Heckman, J., Layne-Farrar, A., & Todd, P. (1996). Human capital pricing equations with an application to estimating the effect of schooling quality on earnings. *The review of economics and statistics*, 562-610.
12. Hilmer, T., (2021) Chapter 7, Log linear and log log models, Available at URL: <https://www.youtube.com/watch?v=POHoCvoahFA>
13. Katz, L. F., & Murphy, K. M. (1992). Changes in relative wages, 1963–1987: supply and demand factors. *The quarterly journal of economics*, 107(1), 35-78.
14. Lester, R. (1967). Pay differentials by size of establishment. *Industrial Relations: A Journal of Economy and Society*, 7(1), 57-67.
15. Mincer, J. (1958). Investment in human capital and personal income distribution. *Journal of political economy*, 66(4), 281-302.
16. Mincer, J. (1974). Schooling, Experience, and Earnings. *Human Behavior & Social Institutions* No. 2.
17. Mincer, J. (1997). The production of human capital and the life cycle of earnings: Variations on a theme. *Journal of labor economics*, 15(1, Part 2), S26-S47.
18. Park, J. H. (1994). Returns to schooling: a peculiar deviation from linearity (No. 714).
19. Patrinos, H. A. (2016). Estimating the return to schooling using the Mincer equation. *IZA World of Labor*.
20. Polachek, S. W. (2007). Earnings over the lifecycle: The mincer earnings function and its applications (iza discussion papers no. 3181). Institute for the Study of Labor, Bonn.
21. Qu, D. (2015). REVISITING COMPENSATING WAGE DIFFERENTIALS: THE EVIDENCE FROM EMPLOYER-PROVIDED HEALTH INSURANCE. *IBA Business Review*, 10(1).
22. Romaguera, P. (1991). Wage differentials and efficiency wage models: Evidence from the Chilean economy.
23. Rupert, P., Schweitzer, M. E., Severance-Lossin, E., & Turner, E. (1996). Earnings, education, and experience. *Economic Review-Federal Reserve Bank of Cleveland*, 32, 2-12.

24. Salop, S. C. (1979). A model of the natural rate of unemployment. *The American Economic Review*, 69(1), 117-125.
25. Schmidt, C. M., & Zimmermann, K. F. (1991). Work characteristics, firm size and wages. *The Review of Economics and Statistics*, 705-710.
26. Stigler, G. J. (1962). Information in the labor market. *Journal of political economy*, 70(5, Part 2), 94-105.
27. Stiglitz, J. E. (1986). The Wage-Productivity Hypothesis: Its Economic Consequences and Policy Implications.
28. Strand, J. (1987). The Relationship between wages and firm size: an information theoretic analysis. *International Economic Review*, 51-68.
29. Weiss, A. (1980). Job queues and layoffs in labor markets with flexible wages. *Journal of Political economy*, 88(3), 526-538.