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Keyword list
Afghanistan; Mincer; Income; Regression; Household.

Abstract

Today’s household income is often used as an important indicator of Economics. Understanding the case of problems and upgrading the income of share of household is not only an academic interest but also very helpful for future planning that the government and also policy makers take into account. The main objective of this research is to assess which factors effect on income of Household in Afghanistan. And also to analyse the important elements of these factors on Household income in five most populated provinces of Afghanistan since the level of incomes in these provinces including rural and urban areas differ vastly. Besides analysing the factors, this research aims to take into account how positive or negative effects of each variable have affected the household income in local areas. The paper also investigates the changes of factors determining the household incomes in the whole part of area and each province separately. The result of this research will not only show how successful policies of government have been, but also indicates the important factors that policy makers should take into account for future plans of government.

Description of Data

Both primary and secondary sources have been used to collect the data. The primary data collection involved a sample survey which was conducted in the study location during the period April-August 2009. The survey involved the interviewing of 290 households head in the research area including Kabul, Herat, Nangarhar, Kandahar and Balkh. A well-defined structured questionnaire was used as a tool for the primary data collection the researcher also had informal discussions with the Ministry of Agriculture, CSO, and some government and nongovernment organization to collect the primary data. The secondary data on size of families, source of income that exist in every province in the study area and the lives of family was collected from central Statistical office of Afghanistan. The number of employed people in farm activity, amount of productions and livestock activities related
data was collected from Ministry of Agriculture and some nongovernment organization. The periodical reports on household income that is published by CSO, Ministries and other organizations such as NGO, USAID, WFP and NARV are other sources that are used in the form of secondary data.

**Theoretical contextualization**

**Mincer Earning Regression Model**

Mincer earning regression is the most important equation in labor economics that is highly used in empirical earning. Mincer 1958 used the neoclassical capital theory for distribution of earning of individuals in the society. This was the first model of earning applied to measure the earning distribution of people by using the mathematical tools. The model developed by Mincer in 1958, is very inexpensive. Schooling is the first variable that is used in this model, and latter age and some other variables are also added in this function. In this approach, he was accounting the transformation of earnings for adult white men in US data. After successful work in this regards earning function have been applied in more than 100 countries in the world (Polachek, 2007 Pp 2-5).

Comprehensions of individual earning make the very core of social science because it answers questions about basis of human well-being. Moreover, realizing the determinants of earnings helps policy makers to develop their strategy to increase wealth, help each country to reduce the poverty very easily, and increase growth (Polachek, 2007 p.5).

In this innovation, he found that an individual choice produced income very easily by application of human capital theory. He made a model from outcome of person’s investment choices, by this assumption individual invest up to the point where investment costs only equal to the profit of present value of schooling. He worked on some specification of econometric basis’s called log-linear earning function.

Mincer in (1957-1958) concentrated on human capital and personal income distribution, he firstly studied the effect of labor market experience on distribution of earnings and how this effect influences on earnings of individuals. Mincer analysis studies the income inequality between individuals too. He much more focuses on the relationship between earnings and age. He recognizes the importance of estimating difference of age and market experience, and also concentrates to evaluate the concave shape of the experience earnings. While formal training is more difficult than informal training. In this analysis Mincer shows that within an occupation earnings inequality increase with the steepness of earnings profile, this profile is steeper for positions requiring more skill whether acquired during the
education period or during the job. The result of this model is the base for more empirical research in the labor economic (Chiswick, 2003 p. 5-6).

Moreover, Mincer model shows that average level of education would be the main source of income growth in one country. According to Heckman et al, (2003) Mincer model is the cornerstone for economic studies in developing countries for the following reasons. Firstly, this model is the context used to compute the return to education. Secondly, Mincer model is the basis to estimate education quality. Thirdly, it is the best template to estimate the impact of market experience on the wage gaps between male and female. Fourthly, Mincer model has been used in many countries with different time period (Magdalyn, 2013 p. 16).

At this time many scholars and scientist have written many articles regarding Mincer earning function. The most famous of these scholars are David Card, (1999) Heckman et al. (2003) and Lemieux, (2006) David Card concentrates on the econometric issues to find the causal effect relationship between earnings and education of people. Heckman, Lochner and Todd focus to provide some empirical support to Mincer earning function by using old and new data set, and how to best combine future earnings uncertainty. Lemieux focus on the common Mincer earnings function that is the best way to measure the earning of people by the current data set (Polachek, 2007 p.6).

On the foundation of both theoretical and empirical arguments, Mincer built a model with earnings as a function of years of education and a year of market experience in the form of natural logarithm. In the most widely used version of Mincer earning function, log earnings are built from total linear function of years of education and quadratic function of market experience. Mincer in 1974 developed a model of earnings that became one of the most important functions in the empirical economics. It shows the relationship of individual earnings in term of education and market experience.

The standard form of the Mincer regression model is as following

\[
\log Y = \beta_0 + \beta_1 s + \beta_2 x + \beta_3 x^2 \ldots \ldots \ldots \ldots \ldots \ldots \ldots (1)
\]

Where

\[
\text{Log Y} = \log \text{of monthly income}
\]

\[
S = \text{Years of education}
\]

\[
X = \text{Market experience}
\]

\[
\beta_i = \text{parameters to be estimated}
\]

The main advantages of using Mincer earnings function are the ease and simplicity in calculation with small data set. On the other hand, the disadvantage is that parameter \(\beta_1\) is the statement of
average earnings, but the actual return might be different. For application of Mincer earnings function on sources of household income in Afghanistan, it is better to add some control variables on the original model such as the following

\[ \log Y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \beta_5 x_5 + \beta_6 x_6 + \beta_7 x_7 + \beta_8 x_8 + \beta_9 x_9 + \beta_{10} x_{10} + \beta_{11} x_{11} \\
+ \beta_{12} x_{12} + \beta_{13} x_{13} + u_i \]  

\[(2)\]

Where

\[\log Y = \text{Total household income}\]

\[x_1 = \text{Age of Household head}\]

\[x_2 = \text{Narcotics}\]

\[x_3 = \text{Family members}\]

\[x_4 = \text{Female}\]

\[x_5 = \text{House wife}\]

\[x_6 = \text{Experience}\]

\[x_7 = \text{Male}\]

\[x_8 = \text{Married}\]

\[x_9 = \text{Education}\]

\[x_{10} = \text{Saving}\]

\[x_{11} = \text{Experience}^2\]

\[x_{12} = \text{Dari}\]

\[x_{13} = \text{Pashto}\]

\[u_i = \text{Error}\]

For evaluation of total household income all the calculation about income are made at household level, annually and reported in Afghan currency. Incomes that are generated by any source of household income which includes farm activities and nonfarm activities that are received by household or by individual members of the household annually but exclude irregular income. The net income from an activity is obtained by subtracting the cash expenses incurred in the production from the gross income.
Limitations, weaknesses and research gaps

The basic literature reviewed in the previous section has its own weaknesses and limitations. Backer and Cheswick were discussing sources of possible upward and downward bias in the rates of returns from schooling estimated from the schooling earnings function. They said the correlation between years of schooling and years invested in other human capital might be negative. His approach doesn’t look at the whole part of earnings regression. Moreover, it ignores the effect of age profile on income earnings regression.

This research basically looks at how the household structures appear it asks the questions. Which factors affect the wage of workers, where is the biggest source of household income available, and what should be done to upgrade the income of households? The Backer and Cheswick approach will not be useful for this research. Although significant achievement has been made in theorizing Mincer earning regression model since the beginning of the (1974) more remains to be achieved. In this theoretical approach the processes of coordination, and of household’s earnings among the variables operating in the same function, have been given less attention. Furthermore, the analysis focuses on more explicit structural earnings regression than on the social cultural and symbolic relations amongst the factors. Hence further debates. And researches are needed to clarify the key concept of Mincer earning regression model.

Field research design/ Methods of data gathering

1- Study Area

The study area on which this research is based in five largest provinces of Afghanistan namely Kabul is in central part of Afghanistan, Herat in west, Kandahar in south, Nangarhar in east and Balkh in the north, the country is located in central Asia. The area of Afghanistan is 652864 km and the country is mountainous and land locked. The total population of Afghanistan in the year (2014-2015) was estimated around 28 million, including 20.1 million living in rural area and 6.5 million living in urban area and the rest part of the population are living nomads (CSO, 2013).
Afghan population is very young 42% under age 15 years old and only 3.5% older above 65 years old. The afghan populations belong to various ethnic groups such as Pashtuns, Tajiks, Hazaras and Uzbeks and the other minor ethnic groups are Nuristani, Baluchi’s, Turkmens etc. The official languages of the county are Pashto and Dari (CSO, 2013). There are many reasons for the selection of these provinces, we will see in the following

- There are millions of families living in these provinces
- Source of household income and availability of income are more variable
- The area is more secure and accessible for the field research than the other places of the county

Additionally, the CSO support the researcher to make contact with households and provide some other facilities to researcher during the field work in these areas because the area has more security and they are able to support the scholars in these areas. Moreover, the researcher was able to interview with households, employed, government and nongovernmental organization to complete the data that is required.

2- Sampling Techniques

To this research household was taken as a module of analysis and the whole data set were collected at the household level from the head of household. The primary data for this research was based
on the list of all household collected in the five selected provinces namely Kabul, Herat, Kandahar, Nangarhar and Balkh from statistical yearbook of Central Statistical office that is published in (2009). These lists of household were obtained for the purposes of reliable representation of sample size. It is not possible to collect all the information about some study from the total population especially in Afghanistan. For this reason, a sample was selected for the target of this research to determine a convenient sample size. Different approaches are used including tables that are already published, compare of some study sample size and also some formula for small population size. These approaches are not taken in to account to the large population size and no similar studies exist to use a model. For this reason, in this study the following formula published by Cochran (1963) is used to determine the required sample size.

\[ n_0 = \frac{Z^2 pq}{e^2} \]  … … … … … … … … … … … … … … … (3)

Where
\( n_0 \) =Sample size
\( Z^2 \) =Distance between normal curves
\( p \) =Variability
\( q \) =accuracy
\( e^2 \) =Error

3- Method of Data Collection

In this research both primary and secondary data are used. The primary data was collected through personal interview with individual households by using questionnaire instrument. Questionnaire is considered a useful instrument for collection reliable data in a scientific research; often numerical data, and also it gives an opportunity to researcher to compare all income categories in across income group (Cohen et al. 2000, p. 245). The author himself collected more section of data and only some part of data collected by some of friends in each province in the research area. Formal and informal techniques were carried out to collect the data. To complete the required data, general observers are registered who discuss everything needed with the households, regarding all sources of household income they have and get to wish the required information that is needed in the propose of research objective.

4- Household income

Household income is the total income that household receive from farm and non-farm activities. These include Employed, Self-employed, NGO income, Social transfer, saving and Remittance, in
the form of farm activities including Farming income, Livestock income and Narcotic income. For calculating the total household income (in Afghani) an algebraically method for interpretation are used, discussed in the following.

\[ Y_i = x_1 + x_2 + x_3 + x_4 + x_5 + x_6 + x_7 \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots (4) \]

Where

\[ Y_i = \text{Total household income} \]
\[ X_1 = \text{Employed income} \]
\[ X_2 = \text{Social transfer income} \]
\[ X_3 = \text{Farming income} \]
\[ X_4 = \text{Livestock income} \]
\[ X_5 = \text{NGO income} \]
\[ X_6 = \text{Self-employed income} \]
\[ X_7 = \text{other source of income} \]

For measurement the total household income all the calculation about income are made at the household level, and reported in Afghan currency. In this calculation income from both farm and non-farm activities are included, all sources of money that are received by the household or by individual members of household at monthly or more reported intervals, but excludes the cost and other irregular incomes. The net income from activities is obtained by subtracting the cash expenses incurred in the production from the gross income.

**Empirical Result**

Mincer model represent that average level of education in one country would be the mean determinant of income growth. Regarding the theories of Heckman in 2003 and 2006, Mincer model of earning function is one of the most suitable functions of the economic study in developing countries (Heckman, 2006 p. 311). Because of many reasons; firstly, it is precedent used to calculate return to education. Secondly mincer model estimates the effect of work experience and wage gaps in household’s level and lastly it has been calculated with data from many countries and time periods. The model is applied to source of household income in Afghanistan. Since Afghanistan is one of the developing countries, beside the basic variables on mincer model including age, education and
Household income of the sample household was regressed on the different indicator variables of the primary data from five largest provinces of Afghanistan. The result describes the relationship between the total household income and the whole independent variables that are summarized in table-2. The findings represent that the model has overall goodness of fit regarding the value of F Statistics $R^2 = 0.1817$ This value suggests that 18.17% of total variation in household income has been explained by independents variables under this analysis. The T statistic for the most of variables is statistically significant. Furthermore, children, married, family members, female, male, housewife, age of household head and number of educated were not significant ($P > 0.05$) relationship with household income.

The positive sign of the variables indicates that these variables have straightforward relationship with the household income. Furthermore, this sign means that one-unit increase in independent variables will increase one percentage of total household income and vice versa. Moreover, the result of the data set describes that some variables having negative sign of coefficient which could be positive the expectation, but statistically these variables are significant.
Table 1: Empirical result of Mincer earning regression in the form of multiple regression analysis
White heteroscedasticity-consistent standard errors & covariance

<table>
<thead>
<tr>
<th>Variables</th>
<th>Coefficient</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>2.616905***</td>
<td>0.039184</td>
<td>66.78559</td>
</tr>
<tr>
<td>AGEOFHH</td>
<td>7.82E-05ns</td>
<td>0.000867</td>
<td>0.090176</td>
</tr>
<tr>
<td>CHILDERN</td>
<td>0.002539ns</td>
<td>0.021620</td>
<td>0.117446</td>
</tr>
<tr>
<td>NARCOTICS</td>
<td>0.000415*</td>
<td>0.000222</td>
<td>1.869379</td>
</tr>
<tr>
<td>FAMILYMEMBERS</td>
<td>-0.004240ns</td>
<td>0.020850</td>
<td>-0.203378</td>
</tr>
<tr>
<td>FEMALE</td>
<td>0.010991ns</td>
<td>0.022287</td>
<td>0.493139</td>
</tr>
<tr>
<td>HAUSEWIFE</td>
<td>0.013819ns</td>
<td>0.013160</td>
<td>1.050115</td>
</tr>
<tr>
<td>EXPERIENCE</td>
<td>0.001455***</td>
<td>0.000377</td>
<td>3.856992</td>
</tr>
<tr>
<td>MALE</td>
<td>-0.000496ns</td>
<td>0.023017</td>
<td>-0.021547</td>
</tr>
<tr>
<td>MARRIED</td>
<td>0.025833ns</td>
<td>0.019434</td>
<td>1.329293</td>
</tr>
<tr>
<td>EDUCATION</td>
<td>-0.008249ns</td>
<td>0.007966</td>
<td>-1.03586</td>
</tr>
<tr>
<td>SAVING</td>
<td>0.000360**</td>
<td>0.000132</td>
<td>2.738440</td>
</tr>
<tr>
<td>EXPERIENCE^2</td>
<td>-3.01E-06**</td>
<td>1.37E-06</td>
<td>-2.197088</td>
</tr>
<tr>
<td>DARI</td>
<td>0.000943**</td>
<td>0.000396</td>
<td>2.380902</td>
</tr>
<tr>
<td>PASHTO</td>
<td>0.000549**</td>
<td>0.000151</td>
<td>3.647334</td>
</tr>
</tbody>
</table>

R-Squared = 0.1817 Adjust R-Squared = 0.1330 N = 250 F-Statistic = 3.72 P-value = 0.000
* = Significant  ns= not Significant

Source: Survey Result (April- August 2009)
Justification of Mincer Model Variables

- Experience (EXP)

The variable experience of monthly earning has concave curve shipped. According to mincer model (1974) that earnings of individual with relation to experience had concave shape, this means that the marginal effect of experience on earning is positive but decreases with increasing experience. This assumption is not supported with the result of table-1 Firstly, experience increases earnings with the positive sign when the worker has more experience and increases the earnings of households by 0.015% monthly. Moreover, the experience^2 is significant but the relationship is negative on monthly income and it also shows that marginal effect of experience is constant.

- Narcotic (NAC)

The model mentioned that the variable narcotic contributes a positive relationship to monthly income of household in the study area. The T-statistic value is highly significant and the result of the variable accepted at 90% confidence interval. The reason is that most of the farmers in the south, west and northeast of the country cultivated this product and supply to the market.
However, the important point is that most of the benefit of the product collected by land owner and small part accrue to the farmers. Moreover, the maximum income of narcotic was collected by traffickers in national and international market. The summery statistic of Mincer model used in this research for five strong provinces is reported in table-2 The mean of monthly income of household is 2.645$, the standard deviation 0.17026 and the F statistic is 8.97. More details can be seen in table-2 in the following.

### Table-2 Summery statistic of standard Mincer model

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>All</th>
<th>Mean</th>
<th>S-D</th>
<th>F-Statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monthly income</td>
<td></td>
<td>2.659</td>
<td>0.151</td>
<td>3.72</td>
</tr>
</tbody>
</table>

Sources: survey result (April- August 2009)

In terms of control variables that was already added to the model including {children, language, saving, Narcotics and age of household head} are significant and this means that these variables have a positive effect on monthly income of households in the research area. Moreover, the variable married, male, female, children and education did not effect on monthly income in the study area.

- Saving (SV)

It has a direct relationship to income of household. The coefficient is highly significant and the result of the variable in the model accepted at 10% significance level. This means that the families who have more saving invest more in the economic activities. This process was different in the research area between center of each provinces and district. In the central part of each province family invest their saving to bank account and made benefit of this opportunity. However, in the district part of country family give the saving to third person to do some business and the benefit of this business then gets divided between them and the share of family benefit was contributing to total household income.

- Language (Dari and Pashto)

The variable language has a positive relationship to monthly income of household in the study area. The coefficients of both variables are highly significant at 5% significance level. This means that household members have accuses to both languages made more income then one language speaking.
Discussion & Conclusion

The basic target of this study was to determine household income and to find important sources of household income in Afghanistan. This research explains the determinations of household income and concludes with log earnings regression model. It also discusses the important source of household income in Afghanistan and especially in five provinces with log regression model by using Mincer earnings regression. The research indicated the main source of household income in urban and rural area of Afghanistan. The research ascertained that in both areas the income of the households was based according to the model of Mincer. Furthermore, it determined the aggregate income distribution with the measurement of class. The mean finding of this paper is that householders in the local area make their income from farm and non-farm activities.
References


CSO (Central Statistics Organization of Afghanistan),  www.CSO.gov.af


