Analysis of the Factors Affecting the Household Income of Ethnic Groups in Vonhai District, Thai Nguyen Province

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Abstract

Ethnic groups by households in Vo Nhai District often inhabit in rural areas with low income and their life is much more difficult. Therefore, it's necessary to study on the factors affecting their income in order to find a solution to improve their income. This research has used Cobb – Douglass Production Function, applying Stata software to evaluate the factors affecting household income of minorities. By collecting information from 310 households living in Vo Nhai district, Thai Nguyen province, Vietnam, the result of analysis showed that age of householder, cost, number of inhabitants in the family, level of education of the householders, employees, assets, land areas, bank loans which have an impact on the household income of ethnic groups. The study proposed solutions to help poor households expand on their production, improve their income, and enhance their living.

Keywords: Household, Income, Ethnic Group

Introduction

Currently, the majority of ethnic group living in rural areas, and areas with difficult socio-economic conditions and their likelihoods are mainly associated with traditional and backward agricultural production (Khai et al., 2014). To compared with general status of the state, ethnic minorities still live with many difficulties, facing many challenges in economic development, ensuring social security, taking care of the material and spiritual life of residents, especially the poor; linking economic development with cultural development, socio-political stability and maintaining defense and security in border areas (Cao, 2014; Khanh et al., 2017).

The gap between wealth and poverty of ethnic minorities and other ethnic groups in the district is still wider and continues to increase. Infrastructure and tools for production are lacking and not synchronized; Vocational training and employment solutions for ethnic minorities, especially non-agricultural jobs, have not yet achieved high efficiency; the restructuring of plants and animals has not yet gone into depth; climate change is very complicated; The downside of the market mechanism has severely affected the daily life and life of ethnic minorities, especially poor households (Giang, 2011; Cong, 2015).

The implementation of the project on vocational training and employment solutions, especially for ethnic minorities' households, has not been really effective; many employees after being trained do not perform jobs according to their trained professions or do non-professional jobs; failed to connect the market with labor demand with trained workers, causing waste and loss of resources in vocational training and employment solutions for ethnic minorities (Manh et al., 2020).

In addition, in recent years, the situation of climate change and extreme weather has become complicated, seriously affecting the health, production and life of ethnic minorities, especially

7

poor households. Living on mainly by agriculture, but lacking productive land, or having productive land but have not been able to access support programs in terms of capital, science and technology, and so on, so the income of households is still low (Tuan et al. ., 2015; Manh et al., 2020).

In order to deal with the above situation, especially to stabilize the socio-political situation, promote the fine traditional cultural values of ethnic minorities, a radical and long-term measure is to strengthen the effective implementation of policies on ethnicity issues, socio-economic development in ethnic minority areas, stabilize the lives of ethnic minority farmers, contribute to stabilizing the situation of ethnic minorities, socio-political situation in the region and across the country. Only when the economic life of the ethnic minorities is improved, the cultural level and awareness are raised, will make the preferential policies work, helping to stabilize the situation of politics, culture - society in ethnic minority areas in particular and the country in general (Ho et al., 2010; Giang, 2011).

Therefore, it is necessary to identify the factors affecting the income of ethnic minority households, thereby giving effective solutions to the actual situation. In this study, the Cobb – Douglass production function was used, with the collection of information from 310 ethnic minority households living in Vo Nhai district, Thai Nguyen province, Vietnam. The analysis results show that the age of the householders, expenses, number of family members, education level of the household head, number of employees, assets, land area, bank loans have an impact on income of households. ethnic minority households. The research has provided solutions to help poor households expand production, improve income and improve living standards.

Theories of peasant economy

Chayanov's theory of peasant economy

According to research by Chayanov (1966) has shown that farmers want to have high income, regardless of where the income comes from, such as their cultivation, or animal raising. Farmers cannot calculate the amount of labor used, so they only take the high profit target to work and generate income. In addition, the peasant economy has endurance, the ability to cope with, and a resilient vitality because on the one hand, it has a balance between labor and consumption demand, on the other hand, it is not under too much pressure on the background of the economy fluctuations in profits like businesses, especially the pressure of losses leading to bankruptcy

Howard's theory of peasant economy

According to Howard (1978) when demographic and labor pressures on land are increasing, land prices are getting higher and higher, land use costs are increasing, the demand and ability to improve production techniques are increasing, which not only meet the family's own consumption needs, but also have to sell to the market to increase income. In addition, agricultural production is limited by land area, so many households have had to increase crops and apply technology to reduce pressure on natural conditions as well as increase labor productivity for households

Modern theories of peasant economy

McGee (1998) studied peasant economy in the development process; household economy in the context of industrialization and urbanization. Through this, the basic differences between households and families have been found. The impact of urbanization and industrialization has changed the rural economic structure and household economic activities have also changed It clearly shows that the role of household economy is not overshadowed in the role of labor source. In addition, it is necessary to promote the production of goods according to the market

mechanism, the household economy needs a favorable environment; therefore, the goods of households will have better access to the market, helping to develop the household economy.

Method

The production function is used to evaluate the impact of inputs on the output of a production process. Therefore, to evaluate the impact of loans on the income of poor households, the author uses the Cobb-Douglas production function because:

The Cobb-Douglas production function that reflects the relationship between inputs and outputs has the following form: $Y = A.\prod_{i=1}^{n} X_i^{\alpha i} e^{\sum_{j=1}^{n} \beta_j D_J}$ (1). Vì vậy

Y is the income of poor household; A is a constant, X_i (i = 1-n) Input amount I; n is the input factor; αi (i= 1-n) is the influence coefficient of the independent variables Xi to Y according to the independent variables Xi); Dj (j= 1-n) is the j dummy variable; βj (j= 1-m) is the influence coefficient of the variables Dj. From the Cobb – Douglas production function we take the natural logarithm of both sides to get: $\ln Y = \ln A + \sum_{i=1}^{n} \alpha_i \ln X_i + \sum_{j=1}^{m} B_j D_j$ (2)

Thus, equation (2) has the form of a linear function $Y = \beta_0 + \beta_i X_i + u_i$ and is estimated by the OLS method (Ordinary Least Squares). Estimating the parameters of the production function in the form of a linear model using the OLS method will allow identifying the relationship between the income of poor households borrowing capital with investment levels such as loan capital, number of employees, and interest rate.

Total elasticity α_i has important economic significance:

If the sum of the elasticity coefficients $\sum_{i=1}^{n} \alpha_i = 1$, then the production function shows that income does not change to scale, that is, the % increase in inputs equals the % increase output..

If the total elasticity $\sum_{i=1}^{n} \alpha_i > 1$, then the production function shows a state of increasing income in scale, that is, the % increase in inputs is less than the % increase in output.

If the total elasticity $\sum_{i=1}^{n} \alpha_i < 1$, then the production function shows a state of decreasing in scale, that is, the % increase in inputs is greater than the % increase in output.

The article uses a combination of qualitative and quantitative research methods through primary and secondary data collected. Qualitative research is carried out as the basis for building models and supplementing and explaining from quantitative data results. To assess the impact of loans on poor households, the author uses the Cobb-Douglas production model including variables as in Table 1:

Choose a research sample

According to a report of the People's Committee of Vo Nhai district, Thai Nguyen province, Vietnam, by December 31, 2021, there were 10,590 ethnic minority households in the district. To ensure statistical significance, the author uses the Slovin sample calculation formula as follows:

$$n = N/(1+Ne^2)$$

Where: n: number of sample needed to investigate

N: Overall investigation

e: Is the allowable error

The number of households that need to be surveyed is 386 households, during the inspection process, there are 76 incomplete questionnaires, so only 310 valid votes remain

9

Table 1. Variables explanations

Variables	Explanations	Unit
Age	Age of householder	Year
Cost	Cost for serving business production	Billion VND
People	number of people in poor households loaning	People
Education	Level of education of household heads loaning: calculated from starting to take classess of vocaltional traning.	Number of year school
Labor	Number of labors in poor households loaning	People
Asset	Asset in poor households loaning	Billion VND
Land	Land area in poor households loaning	Ha
Loan	Dummy variables	1: households loaning from bank 0: households without loaning from bank
Gender	Dummy variables	1: household head is male 0: household head is female
Distance	Distance from house to district center	Km

Results and Discussion

In order to assess the impact of these factors on the income of ethnic minority households, the author conducts regression and the results are as follows.

After conducting the regression, with 310 observed variables, we have R-squared = 0.4456 and Adj R-squared = 0.4289, this means that the independent variables explain 42.89% of the dependent variable.

After the regression results are available, the author checks the model's defects, ensures that the model is not defective and the estimated results are solid.

Table 2. Regression results

Variables	Coefficient β	T	P>|t|
Ln (Age)	0.1911	2.32	0.021
Ln (Cost)	0.1275	4.94	0.000
Ln (People)	-0.3749	-3.48	0.001
Ln (Education)	0.1371	3.31	0.001
Ln (Labor)	0.5023	6.38	0.000
Ln (Asset)	0.4683	8.88	0.000
Ln (Land)	0.0930	1.91	0.057
Loan	0.0743	2.03	0.043
Gender	0.0200	0.55	0.582
Ln (Distance)	0.5849	0.80	0.424

Multicollinearity test results

Table 3. Results of muliticollinearity phenomenon

Variables	VIF	1/VIF
Ln (Age)	1.11	0.9003
Ln (Cost)	1.08	0.9146
Ln (People)	1.54	0.6505
Ln (Education)	1.17	0.8577
Ln (Labor)	1.56	0.6417
Ln (Asset)	1.10	0.9120
Ln (Land)	1.09	0.9146
Loan	1.10	0.9120
Gender	1.05	0.9488
Ln (Distance)	1.02	0.9795

From the above data table we can see that all input variables have VIF < 2. Thus, there is no multicollinearity phenomenon in the author's model.

Heteroscedasticity investigation results

Table 4. Heteroscedasticity investigation results

Source	chi2	Df	p
Heteroskedasticity indicator	98,60	63	0.0028
Skewness indicator	22,26	10	0.0138
Kurtosis Indicator	4,31	1	0.0378
Total	125,18	74	0.0002

Thus, there is a phenomenon of heteroskedasticity. Therefore, to overcome this phenomenon, the author uses the Standard Error Adjusted Estimation method to get more solid results.

Table 5. Robust Standard Error results (Robust)

Variables	Coefficient β	T	P>|t|
Ln (Age)	0.1911	2.45	0.015
Ln (Cost)	0.1275	4.84	0.000
Ln (People)	-0.3749	-3.28	0.001
Ln (Education)	0.1371	3.13	0.002
Ln (Labor)	0.5023	6.47	0.000
Ln (Asset)	0.4683	6.99	0.000
Ln (Land)	0.0930	1.80	0.072
Loan	0.0743	2.08	0.038
Gender	0.0200	0.54	0.591
Ln (Distance)	0.5849	0.90	0.369

From the theory of production function, the article has formed a functional model of input factors to income of ethnic minority households in Vo Nhai district, Thai Nguyen province. Research results have shown the following contents;

For the variable Ln (Age) with the coefficient β = 0.1911, the age variable has a positive impact with the income variable. This is relatively reasonable compared with previous research results and in practice. For ethnic minority households in Vo Nhai district, the farmers produce and farm mainly based on their experience or attend some training courses on knowledge of animal

husbandry and cultivation. Therefore, older household heads often have more experience in production (Ho et al., 2010).

The variable Ln (Cost) has the coefficient $\beta = 0.1275$, the cost variable has the same direction as the income of ethnic minority households. This is suitable with some previous studies and with the actual situation in Vo Nhai district. Ethnic minority households have improved their knowledge of production and business, so they have invested more and more in means of production, new production models, high yielding plant varieties, and so on. This leads to an increase in production efficiency and farmers' income. This is the basis for farmers to promote investment and increase family income (Khai et al., 2014; Cong, 2015).

The variable Ln (People) has the coefficient $\beta = -0.3749$, the number of people in the family has a negative impact on the income of the ethnic minority. Most of the ethnic minorities are densely populated in rural areas and disadvantaged areas. The ambient conditions for science and technology still have many poor factors. The phenomenon of giving birth to the third and fourth children is relatively common among poor households, the elderly who are unable to work, households with disabled people, and so on. This puts a heavy burden on the households. Therefore, local authorities need to strengthen in propagating and educating people on family planning, and abolish the outdated practice of favoring men over women and wanting to have sons (Manh et al. , 2020; Khai et al., 2014).

The variable Ln(Education) has the coefficient $\beta = 0.1371$, the education variables of the household head has a positive impact on the income of the ethnic minority household. In the current period, when science and technology are developing more and more, people have applied a lot of knowledge to production, not just depending on experience as before. The head of the household is usually the one who makes decisions in the household's production including: production methods, production models, production products, and so on. In addition, local authorities have also cooperated with organizations to open training courses to guide people in production and business, from which people have more knowledge in their production field. This greatly affects the income of that household (Nghi et al., 2011; Quan, 2013).

The variable Ln(Labor) has the coefficient $\beta = 0.5023$, the number of employees has a positive impact with the income of the households. For ethnic minority households in general and ethnic minority households in Vo Nhai district in particular, most households live in rural areas with low production levels. Although scientific knowledge has been applied in the production process, it still relies heavily on human power. Therefore, the number of laborers of the households has a great influence on the income of the households (Nghia, 2011; Thang et al., 2014).

The variable Ln(Asset), has the coefficient $\beta = 0,4683$, the variable asset has a positive impact with the household income. To expand production, the households need a certain capital. Additionally, to supplement their capital, they decided to loan from the banks because of ensuring their asset. If the assets are high, households can easily invest in production and business, machinery and equipment, and science and technology applications in order to improve their income (Nghi, 2011; Manh et al.,2020)

The variable Ln(Land) has the coefficient $\beta = - 0,0930$, it has the same direction impact as the income. The ethnic minority households mainly inhabit in rural areas, so land area is the source input that is important to expand their production. Many kind of plants have been invested that achieve high economic efficiency. For the households with knowledge of animal raising, they own their farms such as farms of chickens, pigs, and cows. This is the goods that have a high economic value, contributing to improving household income. (Tang, 2002; Thieu, 2010)

The variable Loan affects the income of poor households. This shows the big role of bank capital. The households borrow the available capital to supplement their own capital, thereby expanding production, buying machinery and equipment to improve productivity. Therefore, they can easily reduce their dependence on natural conditions (Tang, 2002; Tuan et al., 2015).

The variable Gender was not statistically significant. Thus, the income of ethnic minorities does not depend on the gender of the household head.

The variable KC (distance) is not statistically significant. Thus, the distance from the residence of the ethnic minority households in the district center does not affect the income of the households because the roads are now quite convenient, the service industries are also developed, especially in the rural areas. Information technology has existed and is gradually closing the gap between regions.

Conclusion and Suggestions

Based on the current income status of ethnic minority households and the results of quantitative research models, we recommend some solutions to help improve the income of households as follows:

Raising knowledge of households: Localities need to take advantage of the supports from the Central Government and international cooperation to make key investments in improving the quality of human resources. Training jobs should be expanded. Also, it's necessary to implement training restructuring and reasonable labor structure for ethnic minority households. It is also important for renovate to improve the quality of vocational training, continue to implement policies to encourage and provide vocational training and support job search for workers after training.

Strengthening production links: the trend of linking in production and business is being widely applied. Therefore, it is important to link among households and between households and businesses. To do this, it is necessary to promote the development of cooperative form, linking households to produce the same product in order to improve competitiveness as well as easily apply science and technology. For enterprises, it is necessary to build a mechanism to consume products for households through contracts and forms 0of support for production households.

Applying science to production: encourage ethnic minority households to apply technology to production, build a coordination mechanism among local agricultural extension centers to open training courses, and deploy technology science application into production. It is crucial to expand conservation forms and experimental places on the basis of taking results, production efficiency as an illustrative model.

Preferential loans from banks: Strengthening coordination with organizations in coordinating and propagating people about this capital source, educating people to raise awareness and responsibility in the capital use to increase their income as well as help families get out of poverty. Therefore, it is vital to strengthen management to ensure capital used effectively, ensure debt repayment ability, reduce overdue debts and bad debts, and spread loan sources to poor households in rural areas.

Authors' Contributions

All the authors have equally contributed in this work.

Conflicts of interest

There is no conflict of interest

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