Hue University Journal of Science
ISSN 1859-1388
Vol. 113, No. 14, 2015, pp. 99-111

FACTORS AFFECTING ECONOMIC WELL-BEING AMONG POOR AND NON-POOR HOUSEHOLDS

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Abstract: This paper focuses on examining the key factors affecting the living standards of Vietnam at the household-level in 2010. In this study, the multiple linear regression model was used to determine the impacts of variables related to the household characteristics, main jobs of heads, and the access of public services on the monthly per capita expenditure of the poor and non-poor based on the data from the Vietnam Household Living Standards Survey 2010. The empirical findings indicate that in 2010 the expenditure per capita of the poor and non-poor households was affected by many factors, including education and qualification level, region, ethnicity, size of household, working member proportion and water source. However, the empirical study shows that although employment sector was one of the determinants of per capita expenditure of the non-poor households, it had an insignificant impact on per capita expenditure of the poor households.

Keywords: Vietnam, poverty, poor and non-poor household, regression models, monthly per capita expenditure

1 Introduction

Poverty is one of the severe problems which the Vietnamese government has been solving as an important poverty alleviation policy. Thanks to the government policies and programs and the efforts of poor people to escape from poverty, Vietnam has made impressive achievements with this issue. According to the assessments of the United Nations, Vietnam had fulfilled Millennium Development Goal (MDG) 1 in extreme poverty reduction and hunger eradication in 2010, sooner than the target of 2015. The poverty headcount ratio sharply declined from 58.1% in 1993 to 14.5% in 2008. Moreover, the results achieved in curbing the malnutrition rate in children under five were also positive, dropping from 44% in 1994 to 1.17% in 2011 [1].

Despite this remarkable success, the task of poverty reduction needs to be continued [2]. Obstacles and challenges, such as the downward trend of poverty reduction still exist. Furthermore, the task of ending poverty becomes more difficult as the macro instability is rising, the economic growth is slowing down, and many of the poor are remaining vulnerable from slipping back into poverty. Particularly, from 1993 to 2010 there were certain problems, such as the high poverty rate among rural areas and ethnic groups, limited access to basic public services for the poor, and the widen gap between the rich and the poor.

With regard to the above problems, Vietnam needs to delineate determinants of economic well-being of poor households in order to propose more effective solutions in poverty reduction. Imai and Gaiha [3] indicated that factors such as the household composition, education, land holding, and location were important determinants of the expenditure and poverty because poor households had more disadvantageous household characteristics with low levels

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Submitted: November 10, 2015; Revised: December 30, 2015; Accepted: February 25, 2016.

of educational attainment, insufficient and unstable employment. Besides, Haughton et al [4] pointed out that high dependency ratios decreased the earnings per capita and indirectly led to poverty. These two studies identified the negative relationship between minority ethnic region and poverty. According to Glewwe, Agrawal, and Dollar [5], ethnic minorities had substantially lower living conditions than Kinh and Hoa households due to their low enrollment rates, higher fertility, and limited access to health services.

In order to find out answers for the causes of poverty of households in Vietnam, this paper attempts to address three research questions, as follows*: (1) How is the situation of poverty in Vietnam and what are the characteristics of the poor and non-poor households in Vietnam? (2) What factors affect the monthly per capita expenditure of the poor and non-poor households? (3) What are possible solutions and recommendations to increase the expenditure and reduce poverty in Vietnam?*

2 Methodology

2.1 Data Analysis Methods

Regression analysis: In this study, two linear regression models for the poor and for the non-poor people were used to determine the different effects of variables on logarithm of monthly per capita expenditure (PCE) between the two models. Despite the numerous factors affecting expenditure per capita, the selection of determinants in these models only focused on household-level variables such as demographic variables, variables relating to education attainments, a variable of employment sector, and variables of levels of access to basic services. To ensure to get the normally distributed data for analysis, the dependent variables chosen in the models were transformed into a natural logarithm.

$$\textbf{Model}: \quad \ln(Y_i) = \beta_0 + \beta_i X_i + \varepsilon_i,\ i = 1, 2, \ldots, 14$$

where, $\ln(Y_i)$ is the dependent variable. It denotes natural logarithm of monthly per capita expenditure of the i-th household in the poor group, or in the non-poor group; β_0 is the intercept; β_i are the regression coefficients; X_i are independent variables which are described in Table 1; and ε_i is the random error term.

Correlation analysis: This research also examined the bivariate correlations and variant inflation factor (VIF) among variables used in the regression models. The highest Pearson's correlation coefficient (Pearson's r) was between working member proportion (Wmp) and child proportion (Childp), with -0.53. The values of Pearson's *r* between child proportion and family size, and logarithm of monthly per capita expenditure were 0.34, -0.27, respectively. The correlation between family size and logarithm of PCE was -0.28. The other correlations, however, were smaller than 0.24. These figures show that correlation among continuous variables was weak. This was one of important points to ensure the research could use these variables for regression models.

The sum of the elderly people proportion, child proportion, and working member proportion is 100%; therefore, in order to avoid multicollinearity, only the variables of Wmp and Childp were selected as explanatory variables of regression models excluding the elderly people proportion. As for regression model for the poor, among explanatory variables, the average value of VIF was 1.47 in which the variable of child proportion had the largest VIF (2.49), and

many of the others were around 1. It means that there was no multicollinearity in the model of the poor. Similarly, there was no presence of multicollinearity in the model of the non-poor because the average value of VIF was 1.39 and no exogenous variable with VIF exceeded 2.43.

2.2 Data Collection

The study used statistical data from the VHLSS 2010 conducted by the General Statistical Office of Vietnam (GSO). The VHLSS 2010 included a total sample size of 69,360 households in 3,133 communes/wards. The VHLSS 2010 was conducted with two types of questionnaire forms for households and for communes.

Table 1. Description and Code of Variables used in the Regression Models

Variables	*Description*	*Type*	*Coding*
logPCE	Logarithm of monthly expenditure per capita spent on food and non-food in 2010 as indicated in thousands of VND	Continuous	
FSize	The actual number of people of the family indicated in number	Continuous	
Wmp	The percentage of working members to family size	Continuous	
Childp	% members aged under 15 years	Continuous	
Fmp	% female members to family size	Continuous	
_IAgegr_1	Group of heads aged less than 25 years old	Binary	No = 0
_IAgegr_2	Group of heads aged from 25 to less than 60 years old	Binary	Yes = 1
_IAgegr_3	Group of heads aged 60 and over years old	Binary	
Gender	It refers to the gender of HH heads indicated in male or female	Binary	Male = 0; Female = 1
_IMStatus_1	The status of marriage of HH heads indicated in single	Binary	No = 0
_IMStatus_2	The status of marriage of HH heads indicated in married	Binary	Yes = 1
_IMStatus_3	The status of marriage of HH heads indicated in widowed	Binary	
_IMStatus_4	The status of marriage of HH heads indicated in divorced	Binary	
_IMStatus_5	The status of marriage of HH heads indicated in separated	Binary	
Region	The region where households live in urban or rural	Binary	Urban = 0; Rural = 1
Ethnicity	The religion of head as indicated in ethnic majorities (Kinh/Hoa) or minorities	Binary	Kinh/Hoa = 0 Minorities = 1
EduQuali	Educational backgrounds of heads sampled receiving formal education.	Discrete	No qualification = 0; Primary school = 1; Secondary = 2; High school = 3; College = 4; University = 5; Master = 6; Doctor = 7

Variables	*Description*	*Type*	*Coding*
VocQuali	The levels of vocational qualification heads completed	Discrete	No qualification = 0 Elementary = 1; Middle level = 2 Professional school = 3 Vocational college = 4
EmSector	The working sector which main job of heads belongs in agriculture, industry, or services sector	Binary	Non agriculture = 0 Agriculture = 1
WaterSource	The main water sources households used in 2010	Categorical	Tap water reaching the house = 1; Public tap water = 2;…; Bought water = 8; Rain water = 9; Others = 10
LightSource	The main electricity sources households used in 2010	Categorical	National-grid electricity = 1 Battery lamp, resin torch = 2; Gas, oil, kerosene lamp = 3; Others = 4

However, with the aim of focus on household characteristics, the researcher utilized the data of 9,399 households (2,649 and 6,750 households in urban and rural areas, respectively) who were interviewed to gather the wide range of data, and main information about their income and expenditure, employment status, education, medicine, housing condition, and durable assets owned by households in 2010. The questionnaire for the household-level was designed in detail to avoid omitting data and to improve the quality of the survey data. There were eight sections with a series of topics about both monetary and non-monetary measures of household welfare and a set of household behavioural characteristics. As for the sampling, GSO used the method of systematic random sampling and directly interviewed household heads and others in their families.

3 Data Analysis and Findings

3.1 Poverty Situation in Vietnam

Trends of increase in monthly per capita income and expenditure by region and income quintile

Thanks to the high economic growth rate in Vietnam, the income and expenditure of people in both urban and rural areas and the five income quintiles significantly increased between 1995 and 2010. However, over the period the income and expenditure of people in urban areas were always much higher than those of people in rural areas.

As can be seen from Table 2, the urban real income per person per month was more than 1,126 thousand VND, being 2.62 times as much as that in rural areas with only approximately 300 thousand VND in 1995. After that there was a gradual decrease in the urban-rural income gap which fell by 0.63 during the period. The reason for this trend is that urban population enjoyed a smaller average annual income growth rate than that of rural people (4.3% and 6.3%, respectively). This implies that the income inequality between urban areas and rural areas was improved.

Table 2. Monthly per Capita Income and Expenditure by Region

Year	*1995*	*2002*	*2004*	*2006*	*2008*	*2010*
Monthly Income per Capita (VND 1,000, at constant 2010 prices)*						
National	512.7	715.7	875.3	989.1	1,159.8	1,378.1
Urban	1,126.4	1,250.3	1,473.4	1,644.7	1,870.7	2,129.5
Rural	429.1	552.9	683.2	785.8	888.3	1,070.4
Monthly Expenditure per Capita (VND 1,000, at constant 2010 prices)*						
National	422.9	590.9	717.3	794.1	923.0	1,211.0
Urban	907.5	1,000.9	1,178.1	1,261.8	1,450.9	1,828.0
Rural	356.7	466.3	567.4	624.7	721.4	950.0
Urban to Rural (Times)						
Income	2.62	2.26	2.16	2.09	2.11	1.99
Expenditure	2.54	2.15	2.08	2.02	2.01	1.92

*Sources: GSO [6], [10]; * Data calculated by the author*

In the same way, the urban-rural expenditure gap was gradually narrowed from 2.54 in 1995 to 2.15 times in 2002 and 1.92 in 2010. The smaller gap was made by the greater growth of expenditure in rural areas than in urban areas; in particular, the PCE in rural areas rose by more than 6.7% each year compared with just over 4.7% in urban areas over the given time.

Vietnam faced with the trade-off between promoting growth and solving inequality. Although the impressive economic growth benefited all groups of people, the income and expenditure of the bottom 20% of earners always grew much less than the richest 20% of population. Therefore, between 1995 and 2010 the gaps in monthly per capita income of the richest household quintile and the poorest one widened significantly from 6.99 to 9.23 times, respectively. Similarly, the expenditure gap rose by over 0.5 in the same period (see Table 3).

Table 3. Monthly per Capita Income and Expenditure by Income Quintile

Year	*1995*	*2002*	*2004*	*2006*	*2008*	*2010*
Monthly Income per Capita (VND 1,000, at constant 2010 prices)*						
Quintile 1	184.8	216.5	256.2	286.4	320.5	369.4
Quintile 2	310.2	358.4	434.9	495.6	556.1	668.8

Year	*1995*	*2002*	*2004*	*2006*	*2008*	*2010*
Monthly Income per Capita (VND 1,000, at constant 2010 prices)*						
Quintile 3	414.7	504.5	627.0	713.1	815.7	1,000.4
Quintile 4	566.2	744.6	929.1	1,054.5	1,244.0	1,490.1
Quintile 5	1,292.6	1,754.4	2,136.3	2,395.7	2,864.8	3,410.2
Monthly Expenditure per Capita (VND 1,000, at constant 2010 prices)*						
Quintile 1	210.2	247.2	289.1	313.9	384.6	499.0
Quintile 2	299.3	341.7	408.4	444.4	536.1	720.0
Quintile 3	368.9	430.1	531.2	585.8	662.0	914.0
Quintile 4	37.6	40.5	46.2	52.8	66.9	90.5
Quintile 5	866.9	1,103.4	1,292.0	1,425.0	1,621.1	2,311.0
Quintile 5 to Quintile 1 (Times)						
Income	6.99	8.11	8.34	8.37	8.94	9.23
Expenditure	4.12	4.46	4.47	4.54	4.21	4.63

*Sources: GSO [6], [10]; * Data calculated by the author.*

Poverty trend in Vietnam during the 1993 - 2010 period

In terms of reducing absolute poverty, Vietnam is one of the countries having the most impressive achievements in the world [7]; there was a consistent fall of poverty incidence from 58.1% to 14.5% of total population between 1993 and 2008 (see Table 4). Nevertheless, the speed of decline in poverty rate decreased from 1993 to 2008. The average poverty incidence decreased by approximately 4.1% per year between 1993 and 1998, but downed to nearly 2.1% in the next four years, and reached only about 1.3% from 2004 to 2008. It is expected that if the old method for measuring poverty - consistently applied for the 1993-2008 period - was kept to calculate the 2010 poverty line, this downward trend would be continuously seen at least until 2010. The reason for this prediction is that compared with 2008 the real 2010 PCE of the bottom quintile rose by 30%, the highest rate observed in the course of every two years.

However, Vietnam has made significant changes since 2009. In order to better reflect the household well-being, an updated GSO-WB poverty monitoring system was applied and a new method for measuring poverty was also used. After adjusting the national poverty line to 653 thousand VND, the proportion of people living under the poverty line was 20.7% in 2010.

Comparing urban and rural areas, it can be seen that the rural poverty incidence was always at a higher level than that of urban areas from 1995 to 2010. Poverty in the ethnic minority groups has become one of the most serious social issues in Vietnam in recent years [8]. Although Vietnam has remarkably cut its poverty rate in both ethnic majority and minority groups, people of the minority ethnicity have seen less progress than the rest of the population. In 1993, the poverty rate of ethnic minorities was about 1.6 times as much as that in ethnic majorities, whereas this figure for 2010 was 3.6 times. According to the World Bank [9], there are

six specific "pillars" of weakness which cause the minorities to remain poor: "lower levels of education; less mobility; less access to financial services; less productive lands; lower market access; and stereotyping and other cultural barriers".

Table 4. Poverty Incidence in Vietnam, 1993 - 2010 (%)

	1993	***1998***	***2002***	***2004***	***2006***	***2008***	***2010****
National	58.1	37.4	28.9	19.5	16.0	14.5	20.7
Urban	25.1	9.5	6.6	3.6	3.9	3.3	6.0
Rural	66.4	45.5	35.6	25.0	20.4	18.7	27.0
Ethnic Majorities	54	31	23	14	10	9.0	18.7
Ethnic Minorities	86	75	69	61	52	50.3	67.9

*Sources: WB, 2013; * The 2010 poverty estimate is not comparable with previous estimates.*

Inequality trend in Vietnam during 1993 - 2010 period

The economic growth has improved the household living standards in Vietnam. However, the poor groups have benefited from this process far less than the non-poor [10]. Although the income of all quintiles grew, the income gap between the quintile 5 (the richest) and quintile 1 (the poorest) went up by 2.24 times during the period (see Table 3). As a result, inequality was on the rise: the income Gini coefficient increased from 0.420 in 2002 to 0.433 in 2010 (see Table 5).

Table 5. Income Gini Coefficient in Vietnam, 2002 - 2010

	2002	*2004*	*2006*	*2008*	*2010*
Whole Country	0.420	0.420	0.424	0.434	0.433
Urban	0.410	0.410	0.393	0.404	0.402
Rural	0.360	0.370	0.378	0.385	0.395

Source: GSO, 2012

There were a number of reasons for the increase in inequality in Vietnam. From 2002 to 2010, a large proportion of the poor still remained their jobs in the agriculture sector that generated low income sources. Conversely, for the reason that more family members worked in the non-agriculture sectors as their main occupations, the richer households earned higher income than the less well-off ones. Besides, the poor often had lower educational and vocational qualification levels and larger family size than the non-poor did. Moreover, most of poor people lived in rural and mountainous or remote areas where there were fewer resources invested by the government and private sector than in urban or delta regions [11]. Hence, they lacked opportunities to strive to get wealth.

Table 5 showed that the inequality in urban areas was more serious than in rural areas. This is also observed in some developing countries that promote their economies such as China [12]. But surprisingly, inequality in urban areas was going downward compared with the in-

creasing disparity between rich and poor in rural areas. The reason for this trend was the decreasing urban-rural income gap (see Table 2).

3.2 Characteristics of Poor and Non-poor Households in Vietnam

The data collected from VHLSS 2010 were analyzed by using the statistical description and comparison method. It is found that the poverty situation of households in Vietnam in 2010 was due to the following main factors:

Most of the poor households were large size (the average household size was 4.5 people) and concentrated mainly on rural households, which accounted for 90% of total poor households. This led to the increase in the burden of spending and thus decreased households' saving, as well as resulted in a circle of poverty. The household size in the male headed families was larger than that of families headed by females in the whole nation, regions, and ethnicity. The same situation appeared in both the poor group and the non-poor group. These statistics helped the researcher to explain the effect of gender on PCE in section 3.3.

Besides, the dependent rate in poor households was very high (average number of dependents/household was 2 people). The dependent rate for the poor was 44.4%, whereas it was 33.6% for the non-poor. It was also one of the important and contributing factors of well-being and poverty of the people because it could increase the burden on the working members in the family. As a result, the labor shortage could cause insufficient income to meet living expenses. Therefore, the basic human needs of the poor could not be satisfactorily met; their lives could fall into poverty.

In addition, most of the heads of poor households often had low education (36% of total poor heads had no diploma or never received education). Because of the lack of education, it was difficult to conduct human capital accumulation, which resulted in lower labor productivity and ability of the poor. Consequently, they did not have many opportunities to earn well-paid jobs. Another reason why the income of the poor was low and unstable is that a majority of the poor lacked working skills (97%) and worked mainly in agriculture sector (70%). Therefore, the circle of poverty went on indefinitely and the gap between the rich and the poor actually widened.

Expenditure of the poor was quite limited and mostly spent on food. The degree of access to the basic services for the poor, rural and ethnic minorities was lower than for the non-poor, urban, and ethnic majority people. Although clean water is very important for an individual to have good health, a large proportion of poor households used an unprotected water supply, for instance, unprotected stream or rain water, while a minority of the poor had tap water reaching the house. More than 30% of rural households lacked clean water, and the same percentage of ethnic minority households faced with this problem. Using electricity is a basic need of humans in modern life. Thus, to improve the standards of living, the citizens need to use these basic services. However, the level of access to the national-grid electricity sources of the poor and the ethnic minority population was lower than the better-off and ethnic majority people. There were still 10% and 15% of poor and ethnic minority families who used battery lamps or gas/oil kerosene lamps for lighting instead of the national-grid electricity sources in 2010.

3.3 Results of Linear Regression Models

Results of linear regression model for the poor

In order to separate the determinants of expenditure affecting the living standards of the poor and the non-poor, the researcher run different models for each type of group of people. Results from the equation of the linear regression mentioned in Section 2.1 are presented in Table 6.

Table 6 relatively demonstrates strong overall support for the model of the poor, in spite of the fact that the factors of the model only account for 18% of the variation in logarithm of the monthly per capita expenditure. The low value of R^2 results from only nine significant exogenous variables in a total of 18 input variables. Another reason for getting such a low value of R^2 is that the researcher only analyses the variables at the household-level, while other factors at a larger scale can affect average monthly expenditure of an individual, such as variables at the community-level. Moreover, the data collection of VHLSS 2010 was conducted by a number of interviewers which caused the possibility of interviewer bias[1] that can influence the results of running data.

To see how the outcome variable (PCE) changes from a one-unit increase in each explanatory variable, it is necessary to interpret the exponentiated regression coefficients, exp(β), as exponentiation is the inverse of logarithm function. With the intercept-only model, the intercept is 6.345 which is the unconditional expected mean of log of PCE. Therefore, the exponentiated value is exp (6.345) = 569.9, which is the mean of PCE, or the average monthly expenditure per poor person is 569.9 thousand VND on condition that the regression model is: log(PCE) = β_0.

The finding shows that the factor of family size has a negative impact on PCE. It means that households with greater family size have lower PCE than smaller size families. The coefficient for family size of the poor is (-0.025). For one-person increase in family size, a 2.5% decrease in PCE is predicted, holding all other variables constant, since exp(-0.025) is 0.975, so the change of PCE, when each family has one more person, is [exp(-0.025) - 1]×100% = -2.5%. By contrast, working member proportion has a significant positive effect on PCE at less than 1 percent level. The coefficient of working member proportion is 0.17. Therefore, if the percentage of working member rises by 10%, PCE is expected to increase by 18.5%. Nonetheless, children proportion and female proportion have insignificant impact on PCE. To capture possible life-cycle effects on PCE, three age groups of population were put to the model. The findings do not seem to support the hypothesis which is assumed that group of older people can have lower spending than younger ones. As for the group of the heads aged less than 25 years old, they spend less than the 60-year-old and over heads. This result is opposite to the finding of Jolliffe and Gaurav [13], who concluded that household living standards increase with expected life cycle and thereafter decline when heads become elderly people. This point implies that the youngest people are at the highest risk of poor living condition but not the oldest generation. Therefore, in making policy of poverty reduction, it is necessary to emphasize supports for the young people.

Table 6. Results of Linear Regression explaining Logarithm of Monthly per Capita Expenditure for Poor and Non-poor Households

Explanatory Variable	***Poor***	***Non-poor***

	Coefficients (β)	*p-value (sig.)*	*Coefficients (β)*	*p-value (sig.)*
Family Size	-0.025***	0.00	-0.058****	0.00
Working member proportion	0.170***	0.00	0.148****	0.00
Children proportion	-0.062	0.18	-0.159****	0.00
Female member proportion	0.012	0.74	-0.069**	0.02
Heads aged less than 25	-0.134**	0.01	-0.022	0.62
Heads aged from 25 to 59	0.010	0.65	-0.030	0.08
Gender	0.025	0.36	0.055****	0.00
Heads are single	-0.078	0.15	0.045	0.23
Heads are widowed	-0.046	0.20	-0.068****	0.00
Heads are divorced	-0.058	0.28	-0.041	0.24
Heads are separated	-0.043	0.51	-0.057	0.44
Region	-0.052*	0.02	-0.180****	0.00
Ethnicity	-0.136***	0.00	-0.130****	0.00
Educational Qualification	0.017*	0.02	0.100****	0.00
Vocational Qualification	0.027**	0.01	0.029****	0.00
Employment Sector	-0.017	0.19	-0.083****	0.00
Water Source	-0.006*	0.02	-0.021****	0.00
Light Source	-0.040**	0.01	0.015	0.57
_cons	6.345***	0.00	7.403****	0.00
N	1756		5907	
R^2	0.18		0.30	
F-value	19.49***		128.07***	

Note:, **, ***,**** Significant at 0.05, 0.01, and < 0.01, Analyzed by Stata 12; 1 Interviewer bias: the distortion of response to a personal or telephone interview which results from differential reactions to the social style and personality of interviewers or to their presentation of particular questions (Gordon, 1998).*

Marital status of heads does not prove to have a strong relationship with the dependent variable of PCE. The results also show that the differences in PCE between households whose heads are married and ones with single or widowed, divorced, or separated heads are insignificant.

One of the most valuable findings is that of the impacts of region and ethnicity on PCE. With holding all other variables constant, the poor ethnic minorities' PCE is 12.7% lower than that of the poor in the ethnic majority communities. This result reinforces a similar finding offered by Minot et al. [14]. The corresponding figure for the rural poor reveals that their PCE is predicted to decline by 5% from PCE of the urban poor. The lower well-being measured by PCE of rural households in this model has the same evidence as the previous assessment of the Amoako-tuffour and Armah [15]. It is noted that ethnicity has the bigger magnitude of the coefficient than region variable. Hence, this point shows that ethnicity's effect is stronger than that

of region variable. Larger family size is a reason why the rural poor and ethnic minority poor have lower PCE than their counterparts in urban areas and in ethnic majorities.

The educational and vocational qualifications play important roles in the well-being of households. Both educational and vocational qualifications positively influence PCE. Specifically, heads having higher levels of educational and vocational qualifications are forecasted to spend more. The coefficient of educational qualification is 0.017 significant at 2% level, so for every unit increase in educational level it is expected that PCE will grow by 1.7%. Similarly, a 2.8% increase in PCE is estimated to see when vocational qualification level increases by every unit. These effects show that improvement in education and training for the poor is one of the effective solutions to upgrade the well-being and eliminate poverty.

Surprisingly, much as the coefficient of variable of employment sector has the sign that households with the main job in the agriculture sector have lower expenditure than households mainly working in the industry and services sectors with -0.017; employment sector is not a determinant of PCE of the poor because the *p*-value is 0.19, greater than 0.05.

Two variables of the degree of access to basic public services are also predictors of PCE. However, the access to water sources seems to have very little effect on PCE, while lighting source appears to significantly affect the expenditure of the poor. With all other variables held constant, and for every unit increase in water source, it is expected that there is a 0.6% increase in PCE, while the corresponding figure for light source is approximately 3.9%.

Results of linear regression model for the non-poor

The results for the non-poor group of people show that 13 out of 18 factors have significant influences on the logarithm of monthly per capita expenditure. With a larger sample size, it leads to higher R^2 for this model than for the poor model. With the model for the non-poor, 30% of logarithm of PCE can be explained by 18 factors as reported in Table 6. The results of this model are rather different from those of the model applied for the poor.

It can be seen from Table 6 that children proportion, female proportion, and gender are three factors affecting PCE of the non-poor. Both the percentage of number of children to family size and the proportion of females in a household negatively impact PCE. However, the relationship between female headship and PCE turns positive. This can be explained that the average family size of the female headed families (3.21) is smaller than that of male' (3.94), or perhaps female heads remember more precisely their expenditure than male heads [4].

Between the married heads and widowed heads, there is a significant difference in PCE of the non-poor. PCE in the families whose heads are widowed is 6.6% smaller than that of married heads, while this finding is not seen in the poor model. Nonetheless, the relationship between other groups by marital status of heads is not clear.

On the contrary to the poor, the hypothesis for variable of employment sector is accepted, and this variable is a determinant of PCE of the non-poor. Switching from non-agricultural employment to agricultural work, it is forecasted to see about an 8% decrease in the mean of PCE since exp(-0.083) is 0.92, proposing the other variables are constant. Water source shows the expected impact of access levels on expenditure, but Light source does not prove the same evidence. Perhaps, due to the very high percentage of non-poor using the same electricity from the

national-grip source of light, with approximately 99%, the level of access to electricity is an insignificant factor affecting PCE.

4 Conclusion and Recommendation

Vietnam witnessed positive changes in poverty alleviation during the period from 1993 to 2010. However, a majority of people living under the poverty line dwelled in rural areas and belonged to the ethnic minority groups. Especially, poverty was the serve issue with ethnic minorities when two thirds of total ethnic minority population lived under the poverty line in 2010. Moreover, the widening gap between the poor and the non-poor and rising inequality were also problems in Vietnam over the period.

This study found that for both the poor and the non-poor households the greater percentage of working member, the higher educational and vocational qualifications, and the access to the clean water supply helped to increase the monthly expenditure per capita; meanwhile, for the ethnic minorities and rural areas, the bigger household size appeared to decrease PCE in 2010.

However, the paper demonstrated the differences in the findings between two groups as follows:

Firstly, the factors of children proportion, female proportion, and agriculture sector had negative impacts on the PCE of the non-poor, while they were not statistically significant for the poor.

Secondly, the marital status was not a determinant of PCE of the poor, but among non-poor households widowed heads had lower PCE than their married counterparts.

Thirdly, although gender was insignificant factor of the poor's PCE, this factor had a positive effect on the expenditure of the non-poor;

Fourthly, in terms of age of the household head, it did not impact the PCE of the non-poor, but the factor of heads aged less than 25 caused to decline the PCE of the poor;

Finally, the factor of light source did not show the evidence of its influence on the PCE of the non-poor; whereas, the easier access to the light source contributed to increase the poor's PCE.

Based on the findings of analyses, possible recommendations are suggested to increase the PCE and reduce poverty in Vietnam. Specifically, family planning can help to narrow the family size in order to enable households to afford their family members better satisfaction with both basic human needs and public services. Another way to eliminate poverty is policies on jobs creation for the poor which possibly help them to have employments and diversify the income sources from agricultural occupations and especially from non-agriculture sectors. One more effective solution with the long-run effect is the improvement of educational and vocational standards for the poor. By increasing investment on the infrastructure system in disadvantageous areas such as in mountainous, remote, and rural places, the poor's level of access to the basic public services and security system can be improved. Poverty in the ethnic minority communities is the most severe; thus, more assistance and support are necessary to help them

to strive to get wealth and then narrow the gap between the ethnic minority and majority population.

Acknowledgments

I sincerely thank the Japanese Government and JICE for their financial assistance; I would like to show my deepest appreciation and sincere thanks for those who supported me to do this research, in particular, Professor Makoto Nagahata and Professor Dr. Aki Yonehara and all lecturers, and staffs of Meiji University for their care, advice, warm support and interesting lectures.

References

1. UN. (2012). Đạt được các Mục tiêu thiên niên kỷ trong sự bình đẳng. Retrieved from http://www.un.org.vn/images/stories/MDGs/2012/MDG_1_vn.pdf.
2. Hinsdale I., Marra M., Kozel V., Lanjouw P., Brandt L., Dat V. H., …, Viet Cuong N. (2013). *2012 Vietnam poverty assessment : well begun, not yet done - Vietnam's remarkable progress on poverty reduction and the emerging challenges.* (No. 74910) (pp. 1–190). Washington, DC: World Bank.
3. Imai K., Gaiha R. (2007). *Poverty, inequality and ethnic minorities in Vietnam*. Working Paper. BWPI, Manchester.
4. Haughton D., Haughton J., Nguyen, P. (2001). *Living Standards During an Economic Boom: The Case of Vietnam*. Statistical Publishing House, Hanoi.
5. Glewwe P., Agrawal N., Dollar D. (2004). *Economic Growth, Poverty, and Household Welfare in Vietnam*. World Bank Publications.
6. GSO. (nd). Việt Nam 20 năm đổi mới và phát triển 1986-2005. Retrieved from http://gso.gov.vn/default.aspx?tabid=418&ItemID=4326.
7. Thang N., Trung L. D., Dat V. H., Phuong N. T. (2006). Poverty, Poverty Reduction and Poverty Dynamics in Vietnam. Background Paper for the Chronic Poverty Report, Chronic Poverty Research Centre.
8. Cuong N. Thu P., Tung P., Ngoc V., Daniel W. (2012). *The Impact of A National Poverty Reduction Program on Ethnic Minorities in Vietnam: The Lens of Baseline and Endline Surveys* (No. 50477). MPRA paper, Mekong Development Research Institute.
9. WB. (2009). *Country Social Analysis: Ethnicity and Development in Vietnam*. Main report. Washington, DC: World Bank.
10. GSO. (2012). *Result of the Vietnam Household Living Standards Survey 2010*. Statistical Publishing House.
11. Baulch R. (2008). *Economic development of ethnic minorities in Vietnam*. DFID.
12. Ravallion M., Chen S. (2004). *China's (uneven) progress against poverty*. World Bank Policy Research Working Paper No. 3408.
13. Jolliffe D., Gaurav D. (1999). *Determinants of Poverty in Egypt: 1997*. IFPRI.
14. Minot N., Baulch B., Epprecht M. (2003). Đói nghèo và bất bình đẳng ở Việt Nam: Các yếu tố về địa lý và không gian. IFPRI, IDS.
15. Amoako-tuffour., Armah. (2007). *Poverty Reduction Strategies in Action: Perspectives and Lessons from Ghana*. Lexington Books.