Symptoms and causes of poverty in a rural Vietnamese commune: Does ethnicity matter?

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Abstract

This study uses data from a sample survey of 200 households drawn from a mountainous commune in Vietnam's North Central Coast region to measure and explain relative poverty. Principal components analysis is used to construct a multidimensional index of poverty outcomes from variables measuring household income and the value of domestic assets. This index of poverty is then regressed on likely causes of poverty including different forms of resource endowment and social exclusion defined by gender and ethnicity. The ordinary least squares estimates indicate that poverty is indeed influenced by ethnicity, partly through its interaction with social capital. However, poverty is most strongly affected by differences in human and social capital. Differences in the amount of livestock and high quality farmland owned also matter. Thai households are poorer than their Kinh counterparts even when endowed with the same levels of human, social, physical and natural capital considered in the study. This empirical result provides a rationale for further research on the causal relationship between ethnicity and poverty outcomes.

Keywords: Ethnicity, poverty, rural Vietnam, social capital

1 Introduction

Vietnam is ethnically diverse with 52 different ethnic groups (Baulch *et al.*, 2010). Kinh are the largest of these groups, accounting for 83 % of the total population. The country has achieved high economic growth and remarkable poverty reduction during the past two decades. The poverty rate fell from 60 % in 1993 to 14 % in 2008 (World Bank, 2010). However, poverty levels remain disproportionately high in the ethnic minority groups and rural areas; 52 % of ethnic minorities and 20 % of rural people live in poverty. In contrast, only 10 % of Kinh people and 4 % of the urban population live in poverty (World Bank, 2007). Moreover, an analysis of the poverty gap, which measures the average 'distance' between the expenditures of poor people and the poverty line, shows a far higher depth of poverty amongst the poor of the ethnic minorities. Estimates based on survey data gathered in five national surveys of household living standards conducted between 1993 and 2006 indicate that the poverty gap had shrunk to just 2 % for Kinh people but was still above 15 % for ethnic minorities (World Bank, 2007). Furthermore, Dang (2012) found that ethnic minorities had poverty rates five times higher, and illiteracy rates four times higher, than the ethnic majority group.

One widely accepted reason for these differences in poverty is the geographic remoteness of the ethnic minorities who live mostly in Vietnam's mountainous ar-

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eas. When compared to the plains, these areas generally have lower quality land, less water and less adequate infrastructure, which restricts access to information, markets and public services such as education and healthcare (Epprecht *et al.*, 2011). Some authors argue that other factors contribute to the disparity in poverty levels between Kinh and minority ethnic groups. Van de Walle & Gunewardena (2000) and Baulch *et al.* (2007) point to differences in household characteristics including religious and cultural norms that affect returns to their resource endowments. Both of these studies used subsets of data gathered in the Vietnam Household Living Standards Surveys (VHLSS) and relied on a single variable, expenditure, to measure poverty. Pincus & Sender (2008) have questioned the value of using these data in poverty studies as the surveys excluded vulnerable groups such as immigrants and newly formed households, and did not generate adequate data on social exclusion, a likely driver of ethnically-related poverty differences (Baum & Lake, 2003; DFID, 2005; Porter & Craig, 2004). Baulch *et al.* (2007) also point out that while many minorities had improved per capita expenditure over the 1990's, the highland minorities' expenditure had remained static. Baulch *et al.* (2012) found that the gap between rural Kinh and the ethnic minorities had increased 14.6 % between 1993 and 2004. Kang & Imai (2012) drew similar conclusions.

This study uses data from a sample survey of 200 households drawn from a mountainous commune in Vietnam's North Central Coast region to measure and explain their poverty status. The study uses principal component analysis to construct a multidimensional measure of poverty from indicators of poverty outcomes (the symptoms of poverty), and regresses this index on explanatory variables regarded as possible causes of poverty. These causal variables measure household resource endowments and characteristics, including ethnicity and indicators of social capital.

2 Materials and methods

2.1 Symptoms and causes of poverty: A review of literature

Poverty is defined as a level of deprivation such that a person is unable to meet minimum standards of well-being including basic needs (food, accommodation, clothing), healthcare and education (AusAID, 2001). Poverty is often measured in terms of income as people with higher incomes can better afford to meet

their needs. The proportion of individuals whose income or expenditure falls below a defined poverty line provides an absolute measure of the poverty rate. The World Bank, for example, estimates the rate of extreme poverty in countries and regions using a monetary poverty line of $1.25 per capita per day. In Vietnam, the monetary poverty line for rural areas was defined as VND200 per capita per month for the period of 2006–2010 (Vietnamese Government, 2005). While it can be argued that money provides an objective measure of poverty, there is a subjective element in defining poverty lines and hence in measuring absolute poverty rates and poverty gaps.

The simplicity of the monetary approach is both its strength and weakness. Measurement problems aside, the monetary metric is flawed in that incomes and expenditures observed in household surveys are not permanent and may not capture all dimensions of poverty. This is particularly true of small farm households located in remote areas where markets are often missing and public services inadequate. There is now increasing recognition that poverty is a multidimensional issue (Coudouel *et al.*, 2002) stemming from a deprivation of basic capabilities (Sen, 2000). The recently developed Multidimensional Poverty Index (MPI) is an index of acute multidimensional poverty (UNDP, 2010). Income is excluded from this index, and poverty is measured by ten indicators representing three dimensions; education, health and standard of living (including access to water, electricity and sanitation, quality of housing and ownership of appliances). The MPI assigns equal weights to these three dimensions, and equal weights to indicators within each dimension (Alkire & Santos, 2011). Clearly, this introduces an element of subjectivity in identifying the poor and the dimensions in which they are poor.

A multidimensional poverty index measures relative poverty rather than absolute poverty. Relative poverty refers to the poverty status of an individual or household relative to others in the same community. If the purpose of measuring poverty is to identify the poorest members of a community and the dimensions in which they are relatively poor, a multidimensional measure of poverty has the advantage of accounting for a large number of relevant indicators. However, when the purpose is to identify the causes of poverty and their relative contributions to poverty, a distinction has to be drawn between the symptoms and causes of poverty.

In this study, a poverty index was constructed from three variables that were considered to be effective in-

dicators of relative poverty outcomes in the study area. These indicators included annual household income as a measure of liquidity, the current market value of household appliances (such as refrigerators and TVs) as a measure of wealth and the value of household vehicles (predominantly motorcycles) as a measure of mobility, all expressed on a per capita basis to control for differences in household size. A cluster analysis of poor households surveyed by Shinns & Lyne (2004) revealed natural groupings of households that were relatively asset poor and income rich, and others that were relatively income rich but asset poor. In this study, household appliances and vehicles were viewed as representing different dimensions of poverty in a rural community where ready access to services and jobs in urban areas has a profound effect on the quality of life.

Identifying the causes of poverty is important as long-term poverty reduction requires treatment of its root causes rather than of its symptoms (Shinns & Lyne, 2005). The causes of poverty have been associated with:

- Location. This problem manifests in poor natural resources and high transaction costs in remote areas where physical infrastructure is inadequate and access to public services and markets is poor (AusAID, 2001; Baulch *et al.*, 2007; Epprecht *et al.*, 2011). Dang (2012) emphasised the need for more and better roads to address poverty in rural Vietnam.

- Vulnerability. Income shocks are more frequent and severe where people rely on agriculture for livelihoods (White & Killick, 2001).

- Flawed institutions. Insecure property rights and weak regulatory and enforcement systems raise transaction costs and reduce both the incentive and ability to use assets profitably (Acemoglu *et al.*, 2003).

- Lack of human capital. Higher levels of education are associated with higher levels of employment and earnings (van der Berg, 2008). Education also generates social externalities, such as democracy (Kam & Palmer, 2008) and secure property rights (Chadha & Bhaumik, 1992) that are considered to promote economic growth.

- Weak social capital. Social networks that provide safety nets, reduce transaction costs and facilitate access to resources, services and markets help to alleviate poverty (Coleman, 1988; Granovetter, 1992; Putnam, 2000). Social exclusion, such as gender or ethnic discrimination, is therefore viewed as a cause of poverty (Baum & Lake, 2003; DFID, 2005; Porter & Craig, 2004). Dang (2012) stressed the need for better social programmes and education to address poverty in Vietnam. Baulch *et al.* (2007, 2012) found that households in Vietnamese minority groups achieved a lower return to their endowments than did households in the Kinh majority. Some minorities had improved their situation by assimilating with the majority. This suggests possible interaction between ethnicity and social and human capital as causes of poverty.

As noted by Shinns & Lyne (2005), the distinction between causes and symptoms of poverty is not clear-cut. For example, low levels of income today could result in low levels of education tomorrow. Treating the symptoms of poverty may therefore offer more than just short-run improvements in living conditions. In this cross sectional study, where sample households farm the same types of land under the same climatic conditions and institutional arrangements, the variables used to explain poverty included indicators of household endowments of natural, physical, human and social capital.

2.2 The study site and data collection

The research was carried out in the Tam Quang commune in the Tuong Duong district, a mountainous area of the North Central Coast region. The commune is characterised by a high incidence of Thai people, one of the largest ethnic minority groups in Vietnam, and diversity in household incomes and sources of income.

A multistage sample survey design was applied to generate a representative sample of households in Tam Quang commune. Two of the commune's 12 villages (primary-stage units), Son Ha and Bai Xa, were selected with probability proportionate to an estimate of their size, where size was measured by the number of households. A random sample of farm households (secondary-stage units) was then drawn from a list of farm households constructed for each sample village. A constant sampling rate was applied to each sample village, and was sufficiently large to generate a total sample of 200 farm households. This self-weighting sampling process allows sample statistics to be computed at the commune level without weights to account for differences in village size. Data were gathered at the beginning of 2012 by the first author and students from Vinh University using a structured questionnaire and personal interviews with household members. Although the data are analysed quantitatively, many of the variables are qualitative – measuring respondents' perceptions on a three-point Likert-type scale. Five of the 200 cases were excluded from the data set owing to incomplete questionnaires.

3 Results

3.1 Household characteristics and resource endowments

The descriptive statistics presented in Table 1 show that Kinh, Vietnam's majority ethnic group, account for less than 20 % (n=35) of the Commune population whereas Thai account for more than 80 % (n=160). The proportion of household members who view themselves as farmers is significantly lower in Kinh households (25 %) than in Thai households (53 %). Conversely, Kinh households have a much higher proportion of members working in non-farm jobs, and earn substantially higher off-farm incomes than do Thai households. This is consistent with the finding that Kinh households have a substantially higher proportion of adults with tertiary education, and a better educated household head. Although Thai households have a much greater proportion of farmer-members, their farm income is not significantly higher than that of Kinh households. Farm incomes were computed by summing the value of sales reported for each crop harvested from every parcel of land operated by respondent households in 2011. Off-farm income was computed by summing the incomes and remittances reported for each household member that engaged in non-farming activities or wage employment in 2011.

Table 2 suggests that Kinh households are better endowed with non-irrigated lowland while Thai households are better endowed with highland. However, these differences are not statistically significant. Considering that lowland is better suited to arable farming than is highland, this result may reflect the egalitarian way in which land was allocated to households when ownership was decollectivised.

3.2 Measuring Relative Poverty

As mentioned in Section 2.1, the poverty index was constructed from three variables that were considered to be good indicators of poverty outcomes in the study area. These variables, summarised in Table 3, represent income, living standards and access to services and markets as dimensions of poverty. Housing quality is also considered to be an important symptom of poverty in the study area. Although this information was not collected in the survey, housing quality is likely to be highly correlated with mean annual income per household member and, to some extent, with the other two variables. Consideration was given to the inclusion of livestock as a symptom of poverty as households in the study area do store wealth in livestock. However, buffalo are an important source of draft power and, in this study, livestock are treated as part of the household's resource endowment and hence as a possible cause of poverty.

Table 1: *Characteristics of Thai and Kinh sample households*

Characteristics	Thai (n=160)	Kinh (n=35)	t-statistic
Occupation			
Household members that farm (%)	53.3 (1.67)	24.6 (4.67)	5.801 ***
Household members self-employed (%)	6.0 (1.03)	24.0 (5.44)	3.245 ***
Household members that earn a pension (%)	2.5 (0.73)	7.8 (2.90)	1.760 *
Household members employed in non-farm jobs (%)	11.4 (1.46)	45.6 (6.22)	5.356 ***
Income			
Annual off-farm income per household member (1000VND)	2879 (398.16)	10217 (2016.94)	3.572 ***
Annual farm income per household member (1000VND)	565 (82.17)	433 (225.90)	0.552
Education			
Adults with only primary school education (%)	20.8 (1.91)	12.8 (3.98)	1.825 *
Adults with tertiary education (%)	7.1 (1.15)	21.8 (4.65)	3.058 ***
Household head			
Age (years)	46.5 (0.85)	53.3 (2.69)	2.421 **
Education (years)	6.6 (0.23)	8.1 (0.60)	2.340 **

***, ** and * denote significance at the 1 %, 5 % and 10 % level of probability respectively.
Standard errors of mean values in parentheses.
Source: Household sample survey, 2012.

Table 2: *Area and type of land owned by Thai and Kinh sample households*

Land type	Mean area owned		
	Thai (n=160)	*Kinh (n=35)*	*t-statistic*
Irrigated lowland (m² per capita)	117 (6.50)	205 (90.56)	0.966
Non-irrigated lowland (m² per capita)	73 (12.25)	124 (27.67)	1.694
Arable highland (m² per capita)	431 (171.84)	118 (114.24)	1.520
Forest land (ha per capita)	0.82 (27.13)	0.85 (15.90)	0.056

Standard errors of mean values in parentheses.
Source: Household sample survey, 2012.

Table 3: *Indicators of important poverty dimensions by ethnic group*

Indicators	Thai (n=160)	Kinh (n=35)	t-statistic
Annual income per household member (1000VND)	3417 (400.23)	10739 (2034.06)	3.533 ***
Value of key appliances per household member (1000VND)	262 (32.04)	780 (136.63)	3.696 ***
Value of vehicles per household member (1000VND)	914 (177.63)	3155 (857.06)	2.561 **

*** and ** denote significance at the 1 % and 5 % level of probability respectively. Standard
errors of mean values in parentheses.
Source: Household sample survey, 2012.

The indicators of poverty listed in Table 3 were positively and strongly correlated. Principal components analysis was used to identify relationships amongst these indicators and to weight them in a multidimensional index of poverty. Bartlett's Test of Sphericity was statistically significant at the 1 % level of probability, supporting the factorability of the correlation matrix. Only the first principal component had an Eigen value larger than unity (1.9). This component accounted for 64 % of total variation in the indicators and represented all three dimensions well as the loadings assigned to the standardised indicators were all large and positive, ranging from 0.70 for the per capita value of vehicles to 0.85 for the per capita value of appliances. For these reasons, the first principal component was regarded as an effective measure of relative poverty for the sample households.

The first principal component was used to compute a standardised poverty score for each sample household, excluding those households with missing observations on any of three indicators. A total of 187 scores were computed and separated into two groups; sample households with poverty scores below the median (−0.33) were classified as relatively poor, while those with scores equal to or above the median were classified as less poor. Table 4 presents key descriptive statistics computed for these two groups.

The less poor households have better education and a larger share of members employed in non-farm jobs. These jobs earned 7289 thousand VND per capita for the less poor, and just 997 thousand VND for the poor over the past year. There is some evidence that the less poor also earned much higher farm incomes despite the absence of statistically significant differences in land endowments (Table 5). This could be related to their higher levels of education and better cash flow from non-farm wages. The less poor also owned much more farming equipment (458 thousand VND per household) than the poor (7 thousand VND per household).

The poor group accounted for 56 % of Thai households and 22 % of Kinh households in the sample. The proportion of poor Thai households is similar to the national rate of poverty estimated for ethnic minorities (52 %), whereas the proportion of poor Kinh households is double the national rate of poverty estimated for Kinh (10 %). This discrepancy was anticipated as, nationally, most Kinh live in urban areas where the poverty rate is lower than in rural areas like the study site.

Table 4: *Characteristics of poor and less poor sample households*

Indicators	Poor (n=94)	Less poor (n=93)	t-statistic
Occupation			
Household members that farm (%)	56.0 (2.14)	40.9 (2.80)	4.271 ***
Household members self-employed (%)	5.0 (1.58)	12.5 (2.24)	2.748 ***
Household members that earn a pension (%)	1.6 (0.79)	5.2 (1.37)	2.292 **
Household members employed in non-farm jobs (%)	7.0 (1.79)	26.6 (3.02)	5.552 ***
Income			
Annual off-farm income per household member (1000VND)	997 (142.61)	7289 (930.37)	6.685 ***
Annual farm income per household member (1000VND)	393 (82.5)	693 (135.76)	1.186 *
Education			
Adults with only primary school education (%)	25.5 (2.82)	13.3 (2.00)	3.551 ***
Adults with tertiary education (%)	3.5 (1.02)	14.5 (2.16)	4.602 ***
Household head			
Education (years)	5.5 (0.28)	8.1 (0.31)	6.250 ***

***, ** and * denote significance at the 1 %, 5 % and 10 % level of probability respectively.
Standard errors of mean values in parentheses.
Source: Household sample survey, 2012.

Table 5: *Area and type of land owned by poor and less poor sample households*

Land type	Mean area owned		
	Poor (n=94)	Less poor (n=93)	t-statistic
Irrigated lowland (m² per capita)	107 (7.85)	162 (34.77)	1.530
Non-irrigated lowland (m² per capita)	62 (13.85)	98 (18.13)	1.556
Arable highland (m² per capita)	529 (277.62)	251 (103.19)	0.937
Forest land (ha per capita)	1.0 (0.46)	0.7 (0.10)	0.638

Standard errors of mean values in parentheses.
Source: Household sample survey, 2012.

Table 6: *Poverty differences between Thai and Kinh sample households*

Indicators	Thai	Kinh	t-statistic
Mean poverty score for the poor	−0.538	−0.522	0.344
Lowest poverty score	−0.736	−0.736	
Mean poverty score for the top quartile	1.230	3.643	3.416 ***

*** denotes significance at the 1 % level of probability.
Source: Household sample survey, 2012.

The sample survey data do, however, highlight a difference between the local and national poverty gap. Whereas national estimates (World Bank, 2007) suggest that the depth of poverty is far higher amongst ethnic minorities (15 %) than amongst Kinh (2 %), the findings presented in Table 6 show no evidence of such differences between poor Thai and poor Kinh in the study area. Here, differences in living standards between Thai and Kinh occur at the other end of the spectrum as the top quartile of Kinh households have a mean poverty score of 3.64 whereas the top quartile of Thai household have a mean score of only 1.23.

3.3 Causes of poverty

3.3.1 The empirical model

Although there is no clear separation between the causes and symptoms of poverty, the model proposed in this study treats the poverty index (i.e. the first principal component) described in Section 3.2 as a function of variables expected to influence poverty in the long run. These variables include household endowments of natural capital (quality and quantity of farmland), physical capital (draft power and production equipment), human capital (education and employment), social capital (networks and trust in government) and possible social exclusion (gender and ethnicity). Household size and a village dummy were also included to control for differences in the size and location of sample households.

The empirical model is specified as:

$$Ln(Poverty) = \beta_0 + \beta_1 V_1 + \beta_2 V_2 + \beta_3 V_3 + \ldots$$
$$+ \beta_{15} V_{15} + \beta_{16} V_{12} V_{15} + e \qquad (1)$$

where,

$Ln(Poverty)$: Natural Logarithm of (Poverty+5) where the constant is added to remove negative values

V_1: Dummy variable scoring 1 if the village is Son Ha, and 0 if Bai Xa

V_2: Household size (members)

V_3: Adults with tertiary education (%)

V_4: Household head's education (years)

V_5: Household members employed in non-farm jobs (%)

V_6: Value of livestock per household member (1000VND)

V_7: Value of farming equipment per household member (1000VND)

V_8: Irrigated lowland owned per capita (m^2)

V_9: Non-irrigated lowland owned per capita (m^2)

V_{10}: Arable highland owned per capita (m^2)

V_{11}: Forest production land owned per capita (ha)

V_{12}: Household members working in a local authority or civil organisation

V_{13}: Level of confidence in the judicial system (1 for lowest, 3 for highest)

V_{14}: Gender dummy scoring 1 if the household head is male, and 0 if female

V_{15}: Ethnicity dummy scoring 1 if the household is Thai, and 0 if Kinh

The OLS estimates of equation (1) are discussed in the next section.

3.3.2 Results from the empirical model

The estimated model explains 61 % of the variation in the poverty index and is statistically significant at the 1 % confidence level. The highest Variance Inflation Factor is 2.18, suggesting that the estimated model is free of critical multicollinearity. A check for robustness using income as the dependent variable revealed no significant changes in estimated coefficients as the other two variables in the poverty index are strongly and positively correlated with income. Table 7 presents the standardised and unstandardised regression coefficients estimated for equation (1) and their corresponding t-statistics. When interpreting the coefficients it is important to bear in mind that the dependent variable, $Ln(Poverty)$, is an inverse measure of household poverty.

The first two variables, V_1 and V_2, were not treated as policy variables but rather as control variables to account for village and household size differences respectively. However, there is some evidence that an increase in household size (V_2) reduces the poverty score as the regression coefficient estimated for this variable is negative and statistically significant at the 10 % level. This is consistent with the view that poverty is more severe in households that have relatively more dependents (Rim & Rahman, 2008). The next three variables (V_3, V_4, and V_5) are measures of human capital. β_4 and β_5 are both positive and statistically significant. These estimated coefficients suggest that education and job skills impact positively on the poverty score. These results support the view that improvements in human capital reduce poverty.

Variables V_6 through V_{11} measure household resource endowments. The regression coefficients estimated for livestock (draft power) and the area of irrigated lowland (high quality farmland) are statistically significant, indicating that levels of poverty are lower in households endowed with more draft power and more quality land. There is also some evidence that poverty is lower in households better endowed with farming equipment (β_7

Table 7: *Estimated parameters of the regression model*

Variables	Unstandardised coefficient	t-statistic	Standardised coefficient
Village dummy (V_1)	−0.003 (0.024)	0.14	0.009
Household size (V_2)	−0.012 (0.007)	−1.80 *	−0.099
Tertiary education (V_3)	0.040 (0.052)	0.77	0.043
Education of household head (V_4)	0.013 (0.003)	4.69 ***	0.247
Non-farm job skills (V_5)	0.275 (0.039)	7.07 ***	0.436
Livestock (V_6)	7.8E-6 (1.5E-6)	5.04 ***	0.246
Farming equipment (V_7)	2.7E-5 (2.1E-5)	1.26	0.064
Irrigated lowland (V_8)	2.5E-6 (7.2E-7)	3.54 ***	0.179
Non-irrigated lowland (V_9)	1.7E-6 (1.9E-6)	0.09	0.005
Arable highland (V_{10})	−8.8E-7 (1.5E-6)	−0.61	−0.030
Forest land (V_{11})	−1.2E-8 (3.6E-8)	−0.32	−0.014
'Linking' social capital (V_{12})	0.156 (0.048)	3.23 ***	0.333
Trust in judicial system (V_{13})	0.0003 (0.0111)	0.03	0.002
Gender dummy (V_{14})	−0.017 (0.026)	−0.67	−0.038
Ethnicity dummy (V_{15})	−0.048 (0.029)	−1.67 *	−0.110
Interaction between linking social capital and ethnicity ($V_{16} = V_{12} * V_{15}$)	−0.150 (0.054)	−2.76 ***	0.278
Constant	1.514 (0.053)	28.7 ***	

***, ** and * denote significance at the 1 %, 5 % and 10 % level of probability respectively
Standard errors are in parentheses.
Source: Household sample survey, 2012.

has a p-value of 0.21), but no evidence that relative poverty is influenced by different endowments of non-irrigated lowland (V_9), arable highland (V_{10}) and forest land (V_{11}). This finding was not unexpected as the poor and less poor households owned similar areas of these land types (Table 6). However, this contrasts with van de Walle & Gunewardena's (2000) finding that minority ethnic groups in Vietnam benefit from relatively larger areas of (lower quality) highland and forest land.

The remaining four variables (V_{12} through V_{16}) measure social and demographic characteristics of the sample households. The regression coefficient estimated for 'linking' social capital is positive and statistically significant. Linking social capital refers to vertical relationships between people across hierarchical levels (Szreter & Woolcock, 2004), and is measured in this study by the number of household members working for a local authority or civil organisation. The results are therefore consistent with the view that this form of social capital reduces poverty by improving access to information and resources, and the power to control those resources (Emerson, 1962). In contrast, the poverty score is not influenced by differences in perceptions of trust in the judicial system. This suggests that both poor and less poor households in Tam Quang commune have similar perceptions of the legal system. Likewise, there is no evidence that poverty is influenced by the gender of the household head.

Importantly, the regression coefficient (β_{15}) estimated for the ethnicity dummy is negative and statistically significant. The implication is that Thai households achieve lower poverty scores than their Kinh counterparts, *ceteris paribus*. This finding is consistent with the results of earlier studies showing that higher levels of poverty observed in Vietnam's minority ethnic groups are only partly explained by differences in resource endowments, and inferences that lower levels of productivity in the use of resources also contribute to their relative poverty (Baulch *et al.*, 2007; Neefjes *et al.*, 2002). Williamson (1979, 2000) argues that economic incen-

tives and decisions are influenced by both formal and informal institutions. Although relative poverty in this sample of Thai and Kinh households is not affected by gender or perceptions of the legal system as measures of social exclusion, it seems that these ethnic groups do follow different social norms that affect their productivity in resource use.

Interestingly, the coefficient estimated for the interaction between linking social capital and ethnicity (V_{16}) is also negative and statisically significant. This result provides the basis for evaluating the total partial effect of ethnicity in greater detail. Given equation (1), the impact of ethnicity on the poverty score is measured by β_{15} + ($\beta_{16}V_{12}$). Hence β_{15} is the impact of ethnicity if linking social capital is zero. The coefficient estimated for the interaction term indicates that for the average level of linking social capital (0.1076), the impact of ethnicity is negative and amounts to -0.064 (= -0.048 − (0.150 ∗ 0.1076)). In other words, Thai households benefit less from higher levels of linking social capital (β_{12}=0.156) than do Kinh households. To test the statistical significance of the interaction variable, equation (1) is re-estimated after substituting V_{12} with $V_{12} - 0.1076$. Although β_{15} is unchanged, its absolute t-statistic increases to 2.26 with a p-value of 0.025 implying that the impact of ethnicity is negative and statistically significant at the 5 % level.

The last column of Table 7 presents the estimated regression coefficients in standardised form. Since these coefficients are unit free, their absolute magnitude provides an indication of the relative contribution that each variable makes to the poverty score. Amongst the subset of statistically significant explanatory variables, the indicators of human and social capital stand out as the most important drivers of household poverty scores, followed by physical capital in the form of livestock and irrigated cropland. Ethnicity is also important, with part of its total effect attributed to interaction with social capital. The policy implications of these findings are considered in the next and final section.

4 Discussion

This study examined the determinants of poverty amongst rural households in two villages of Tam Quan commune. One village comprised a majority of Kinh households and the other a majority of Thai households. Considerable differences were found in the income and domestic assets of Thai and Kinh households. A poverty index computed from these indicators showed that Thai households were concentrated in the poorest half of the sample. A regression analysis of this poverty index indicated that vocational training to improve off-farm job skills would make the biggest contribution to poverty alleviation. Employment in local authorities and civil organisations is viewed as a way of building linking social capital, and the results suggest that this form of social capital plays an important role in reducing household poverty

Land endowments, other than for irrigated lowland, did not have a significant impact on relative poverty in the study area. As the expansion of irrigated lowland areas is constrained by geographic features, livestock programmes may provide a more effective tool to alleviate poverty in the mountainous regions. Livestock are kept primarily as a source of draft power but also offer scope for the production of meat and hides.

Ethnicity also influenced the relative poverty status of sample households. Thai households are poorer than Kinh households even when they are equally endowed with the human, social, physical and natural capital considered in this study. Although other studies have reached this same conclusion, no empirical research has been conducted to explain why ethnicity matters. This study makes a contribution in this regard by accounting for some measures of social capital and social exclusion. Although the results show no evidence of gender discrimination or of ethnic discrimination within the formal legal system, they do indicate that Thai households benefit less from higher levels of social capital. This suggests that the productivity of Thai households may be compromised by informal social norms that reduce their ability or incentive to make better use of their capital endowments. Unfortunately, the blunt measure of ethnicity used in this study did not account for these social norms, nor did the study examine the relative productivity of households. These issues warrant more detailed research as they have not been addressed in other Vietnamese poverty studies.

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