# POVERTY, VULNERABILITY AND SOCIAL PROTECTION IN VIETNAM: SELECTED ISSUES



VIETNAM ACADEMY OF SOCIAL SCIENCES



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## List of Abbreviations

ADB	Asia Development Bank
AusAID	Australian Agency for International Development
BCR	Benefit-Cost Ratio
CAF	Centre for Analysis and Forecasting
CBA	Cost-Benefit Analysis
CEM	Committee for Ethnic Minorities Affairs
CGE	Computable General Equilibrium
CSA	Country Social Assessment
DFID	Department for International Development
ECD	Early Childhood Development
EM	Ethnic Minorities
ESRC	Economic and Social Research Council
FAO	Food and Agriculture Organization
FDI	Foreign Direct Investment
FMD	Foot and Mouth Disease
GDP	Gross Domestic Product
GER	Gross Enrolment Rate
GI	Group Inequality
GSO	General Statistical Office
HEPR	Hunger Eradication and Poverty Reduction
ICOR	Incremental Capital Output Ratio
IDS	Institute of Development Studies
IIA	Independence of Irrelevant Alternatives
IID	Independently and Identically Distributed
IMF	International Monetary Fund
IRPD	Integrated Rural Development Program
LMP	Labor Market Program/Policy
MARD	Ministry of Agriculture and Rural Development

MDGs/VDGs	Millennium Development Goals and Viet Nam Development Goals
MICS	Multiple Indicator Cluster Survey
MNL	Multinomial Logit
MOET	Ministry of Education and Training
MOLISA	Ministry of Labour-Invalid and Social Affairs
MRD	Mekong River Delta
NER	Net Enrolment Rate
NPV	Net Present Value
NTP PR	National Targeted Programme on Poverty Reduction
ODA	Official Development Assisstance
OIE	World Organization for Animal Health
P135-II	Programme 135 - Phase II
PCE	Per Capita Expenditure
PMUB	Participatory Monitoring of Urban Poverty
PPA	Participatory Poverty Assessment
RIM	Rapid Impact Monitoring of Global Economic Crisis
RRD	Red River Delta
SBV	State Bank of Vietnam
SEDP	Socio-Economic Development Plan
SIDA	Sweden International Development Agency
SMEs	Small and Medium sized Enterprises
SOEs	State Owned Enterprises
TFP	Total Factor Productivity
ТОТ	Terms of Trade
UNDP	United Nations Development Program
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNICEF	United Nations Children's Fund
USD	United States Dollar
VASS	Viet Nam Academy of Social Sciences
VGCL	Vietnam General Confederation of Labor
VLSS/VHLSS	Vietnam Household and Living Standard Survey
VND	Vietnamese Dong
VSS	Vietnam Social Security
WB	World Bank
WTO	World Trade Organization

## Summary of the Volume

This volume consists of a number of chapters that are prepared on the basis of background papers for the Vietnam Poverty Assessment 2008-2010. The papers analyze selected poverty-related issues including poverty dynamics, inequality, ethnic minority poverty, risk and vulnerability, and social protection.

Chapter 1, "Poverty Dynamics in Vietnam, 2002-2006" provides a descriptive and multivariate analysis of poverty dynamics in Vietnam using panel data from the Vietnam Household Living Standards Surveys of 2002, 2004 and 2006. Transition matrices and contour plots confirm that while large numbers of households moved out of poverty between these years, many did not move far above the poverty line and that around a tenth of rural households appear to be trapped in chronic poverty. Different categorical models are then estimated by the authors to analyse the correlates of chronic poverty and the drivers of poverty transitions in rural areas. Initial conditions, such as household size and composition, whether the household head comes from an ethnic minority or failed to complete primary school, and residence in northern Vietnam, have important roles in trapping households in poverty. Simultaneous quantile regression models show the chronically poor are more disadvantaged by geography and ethnic minority status, while changes in household size and the share of children matter more to the living standards of the never poor.

Chapter 2, "Preserving Equitable Growth in Vietnam" investigates the recent dynamics of inequality in Vietnam along a number of dimensions, specifically (i) consumption expenditure; (ii) income; (iii) landholding; (iv) educational attainments and achievement, and (v) access to basic public services. The paper also investigated whether an inequality trap exists in Vietnam or not. Evidence from the five VLSSs and VHLSSs showed that from 1993 to 2006, there was considerable inequality in household welfare but overall household welfare was improving. An examination of the Gini index finds that the index rose modestly in rural areas, but dropped slightly in urban areas. The study has shown some evidence of an inequality trap – when inequality in education may not only be affected by the differences in efforts, talents, and luck, but also some other external factors beyond people's control. The "uncontrollable" variables of gender, birthplace and ethnicity were found to bear certain influences on the children's educational opportunities. Income inequality was also found to interact with and reinforce inequality in education as well as in access to healthcare facilities.

Chapter 3, "Ethnic Minority Poverty in Vietnam" is motivated by the fact that although economic reform has brought remarkable progress in poverty reduction in Vietnam, the scale and depth of ethnic minority poverty in Vietnam presents one of the major challenges to achieving the targets for poverty reduction set out in the Socio-Economic Development Plan, as well as the Millennium Development Goals. The authors of the chapter first review a series of monetary and non-monetary indicators which show the living standards of the ethnic minorities are improving but still lag seriously behind those of the majority Kinh-Hoa. The minorities' lower living standards result from the complex interplay of overlapping disadvantages, which start in utero and continue until adult life. Next an analysis of the drivers of the ethnic gap, in terms of both differences in characteristics and differences in returns to those characteristics, is undertaken. Mean and quantile decompositions show that at least a half of the gap in per capita expenditure can be attributed to the lower returns to characteristics that the ethnic minorities receive. The reasons underlying such differences in returns are discussed, drawing on both quantitative analysis and the large number of qualitative studies on ethnic issues in Vietnam. Finally, some of the short and longer term policy measures which the authors believe could help to counter ethnic disadvantages in the nutrition, education and employment sectors are discussed. The authors also emphasize the importance of promoting growth that is geographically broad and socially inclusive – without which, the current disparities between the Kinh-Hoa and the ethnic minorities will continue to grow.

Chapter 4, "Productivity, Net Returns and Efficiency: Land and Market Reform in Vietnamese Rice Production" analyzes a number of key issues of the rice sector in Vietnam. Extensive land and market reform in Vietnam has resulted in dramatic increases in rice output over the past thirty years. The land and market reforms in agriculture were pervasive, moving the system of rice production from commune-based public ownership and control to one with effective private property rights over land and farm assets, competitive domestic markets and individual decision making over a wide range of agricultural activities. The effect of this reform period and beyond is detailed with measures of total factor productivity (TFP), terms of trade and net returns in rice production in Vietnam from 1985 to 2006. Results show that TFP rises considerably in the major rice growing areas (the Mekong and Red River Delta areas) during the early years of reform, and beyond, but also that there is clear evidence of a productivity 'slow-down' since 2000. The differences over time and by region speak directly to existing land use regulations and practices, suggesting calls for further land and market reform. To illustrate this, additional frontier and efficiency model estimates detail the effects of remaining institutional and policy constraints, including existing restrictions on land consolidation and conversion and poorly developed markets for land and capital. Estimates show that larger and less land-fragmented farms, farms in the major rice growing areas, and those farms that are better irrigated, have a greater proportion of capital per unit of cultivated land, a clear property right or land use certificate and access to agricultural extension services are more efficient.

Chapter 5, "A 'Bottom-up' Regional CGE model for Vietnam: The Effects of Rice Export Policy on Regional Income, Prices and the Poor", constructs a 'bottom up' CGE model for Vietnam for 28 commodities and 8 regions (using a GSO input-output table for 2005). The model is used to analyze the recent dramatic increases in the world price of rice and the Vietnamese policy response to limit exports. Although results show limited 'pro-poor' outcomes, the CGE model and a micro-simulation (using 2006 VHLSS data) show that recent rice export quotas resulted in falls total rural savings as measured by the difference in total income less total production cost and consumption of rice.

Chapter 6, "Protecting the Rural Poor: Evaluating Containment Measures against Footand-Mouth Disease in Vietnam" evaluates the containment measures used in Vietnam against Foot and mouth disease (FMD). The stock of farm assets in rural Vietnam, especially cows, buffaloes and pigs, represents an enormous asset and use value to farmers, all of which can be threatened by the incursion and spread of infectious diseases. FMD is a highly contagious viral disease that causes significant mortality in young animals and considerable morbidity in adults, with large losses in weight and economic value. In particular, this study conducts a cost-benefit analysis of a recent and aggressive vaccination program used in Vietnam against FMD. Results show that the payoff to this program, based on even the most conservative measures of relative costs and benefits, are substantial. Net present values of the benefits of the vaccination program are in the neighbourhood of 1.22 billion USD, over the period from 2006 to 20033, with a small standard error. The report also recommends that the vaccination program be continued beyond its current terminal date of 2010 to ensure that these benefits can be realized in the future. In addition, a more aggressive vaccination program, if it leads to an earlier date at which FMD eradication can be declared, or substantially smaller numbers of newly infected FMD animals along the way, is also likely preferred, depending on the extra costs involved. In any case, it is clear that vaccination programs of this sort are fundamental to protecting rural asset values and the livelihood of the rural poor.

Chapter 7, "Compulsory Social Protection: Revealed Preference" investigates enterprises' patterns of and employee's preferences for registration for social insurance. The results show strong evidence that in the same industry, employees working in enterprises that evade (registration or contributions) receive higher net wages than employees working in enterprises that do not evade. The main reason for evasion does not seem to be rooted, therefore, solely in enterprises' will to obtain higher revenues per worker. Employees' lack of understanding of social insurance is probably one of the primary causes of such behaviours. Employee's low regard for social insurance is probably another important factor. Which of these factors is currently dominating in Vietnam is difficult to say. It is likely, however, that in the absence of reforms, the population's dissatisfaction with social insurance services will steadily grow in the future.

Chapter 8, "Social Allowance Policy and the Poor: Assessing Potential Impacts of Decision 67" attempts to assess potential impacts of Decision 67, which was put in effect in April 2007, introducing changes in the categorization of beneficiaries of social assistance allowances as well as the level of allowances. Because there still are not any statistics collected about its implementation, the study uses the data collected in the VHLSS 2006 to measure how many people and families could benefit from such policy if its implementation did not encounter problems of screening or funding. It is found that a large share of the extremely poor would remain excluded.

## 1

#### **Poverty Dynamics in Vietnam, 2002-2006**

Bob Baulch and Vu Hoang Dat

#### **1. Introduction**

During the 1990s and 2000s, Vietnam has had spectacular success at reducing poverty. Depending on the poverty line used, nationally representative household surveys show the poverty headcount has fallen by between two-thirds and three-quarters between 1993 and 2006.<sup>1</sup> Except for China, there is probably no country in the world that experienced such rapid and sustained reductions in poverty during this period.

Vietnam's poverty reduction record, however, remains fragile. While economic growth of between 7 and 8 percent per annum in the early 2000s has dramatically improved the living standards of most people, it has also changed the structure of the economy and the nature of risks that people face. Rapid migration and urbanisation, volatility in world markets, an ageing population with a rising incidence of non-communicable diseases, natural disasters and climate change all confront Vietnam with unprecedented challenges (Joint Donor Group, 2007). The results of recent poverty monitoring exercises suggest that certain sub-groups of the population are particularly vulnerable to falling back into poverty (Oxfam and Action Aid, 2009a and b; VASS, 2009). Due to such exercises and the availability of high quality panel data, poverty dynamics as well as poverty trends are recognised as important issues by many policymakers.

This chapter presents descriptive and multivariate analysis on poverty dynamics in Vietnam using the Vietnam Household Living Standards Surveys of 2002, 2004 and 2006. After describing the extant literature and panel data used, it discusses its modelingstrategy and presents transition matrices and other descriptive statistics concerning the extent of poverty dynamics and chronic poverty in Vietnam. Various categorical and continuous variable models are then used to examine the drivers of exits and entries into poverty and the determinants of per capita expenditures using the panels for 2002-04 and 2004-06.

<sup>1.</sup> Using the General Statistics Office's (national) poverty line, the poverty headcount in Vietnam fell from 58% in 1993 to to 16% in 2006 (VASS, 2007). Using the international PPP \$1.25/day standard, extreme poverty in Vietnam fell from 63.7% in 1993 to 21.5% in 2006 (<u>www.povcalnet.worldbank.org</u>). Non-monetary indicators of poverty also generally show dramatic over this period (VASS, 2007; Baulch et al., 2010).

#### 2. Data and Previous Studies

Vietnam is unusual among developing countries in having high quality, nationally representative household surveys which include a panel component. These surveys were implemented by Vietnam's General Statistical Office (GSO) under funding and technical support from UNDP, the World Bank and other donors. The Vietnam Living Standards Surveys (VLSS) of 1992/93 and 1997/98 were multi-topic surveys patterned after the World Bank's Living Standard Measurement Surveys with nationally representative samples of 4,800 and 6,000 households respectively (Glewwe et al., 2004). These surveys were superseded in 2002 by a new biennial household survey programme known as the Vietnam Household Living Standards Surveys (VHLSS), which uses a rotating core-and-module designed survey with an expanded sample size intended to provide statistics that are representative for most provinces (Phung and Nguyen, 2007). Since 2004, just over 9,000 households have been included in the income and expenditure sample of the VHLSS.<sup>1</sup> Both the VLSS and VHLS surveys have clustered, stratified sampling designs. Though the content of the household and communes questionnaires administered has evolved over time, the core information contained within the surveys facilitates the construction of a set of variables that are consistently defined across the survey years.

There is a panel of around 4,300 households between the two earlier VLSS surveys, and a separate rotating panel of around 4,000 households between rounds in the more recent VHLSS surveys. However, there is no panel linking the VLSS and VHLSS. It is also important to recognize that the VLHSS rotating panel design, in which half of the enumeration areas in each round are replaced by new enumeration areas, means that the three wave panel between the years 2002, 2004 and 2006 is less than half the size of the two wave panels from which it is formed. Once households who drop out from the panel because they have moved, dissolved or cannot be interviewed for some other reason are accounted for, there are 3931 panel households between 2002 and 2004, 4193 panel households between 2004 and 2006, and 1844 households between 2002 and 2006 (Le and Pham, 2009). Utilising the fact that three households should be interviewed in each enumeration area, we estimate attrition at the household level to be 14.0% between 2002 and 2004, 9.5% between 2004 and 2006, and 14.6 % between 2002 and 2006.<sup>2</sup> This is moderate by the standards of panel surveys in developing countries (Alderman *et al.*, 2001). The analysis of attrition in Appendix 1 finds limited evidence that the pattern of attrition between 2004 and 2006 is non-random, and that correction for attrition using inverse probability weights has a very minor impact on poverty dynamics.

Most previous studies of poverty dynamics in Vietnam have used the earlier VLSS panel. For example, Glewwe *et al.* (2002) and Justino *et al.* (2008) apply multinomial logit (hereafter MNL) models to the panel of 4,300 households surveyed in the 1992/3 and 1997/8. Glewwe *et al.* find that households living in urban areas and the Red River Delta and South East were the

<sup>1.</sup> The number of households surveyed in the income and expenditure part of the VHLSS 2002, 2004 and 2006 were 29530, 9189, and 9188 respectively. Income data is also collected from a larger sample of household in the VHLSS.

<sup>2.</sup> Note that because of the way the sample size of the VHLSS was reduced between 2002 and 2004, it is not possible to identify which individual households attrited between 2002 and 2004. It is therefore not possible to test for whether attrition is random between these years. Note also that the VHLSS does not follow households when they split or move from their place of residence.

most likely to escape poverty. Rising returns to education were also important in explaining rising living standards, with households headed by white-collar workers benefiting significantly. Using the same panel, Justino *et al.* find that trade liberalisation has had a material and positive effect on rural household welfare, with most of this effect transmitted to poor households through labour market channels. In a separate paper, Glewwe and Phong (2004) investigates the impact that measurement error has using the VLSS panel, and finds that found that almost half of income mobility was due to measurement error.

A more recent paper by Vu *et al.* (2007) updates the MNL analysis using the VHLSS for 2002-2004 for rural areas. Again using a MNL model, Vu *et al.* find that ethnic minority households have a much smaller chance of escaping poverty than the Kinh-Hoa majority even when differences in location, education and occupation are taken into account. Secondary schooling and non-farm employment both increase the chances of escaping poverty and reduces the risk of falling into poverty among all rural households. Meanwhile primary education and the presence of a permanent road in the commune reduces the risk of falling into poverty for all households living in rural areas. Pham (2008) comes to similar conclusions using a MNL logit for the VHLSS 2002-2004-2006 panel. He also find that households living in the Northern Uplands and North Central Coast are more likely to be chronically poor compared to other geographic regions.

However, as far as we know, there have been no previous studies which utilize different categorical and continuous variable methods to study poverty dynamics for the 2002-2006 period in Vietnam.

#### 3. Modelling Strategy

While the multinomial logit (MNL) model is the most frequently used multivariate approach used to study poverty dynamics, and the only model which has been applied in Vietnam to date, it is not without its critics or caveats. First, the MNL may be criticised for reducing a continuous variable (in this case per capita expenditures) to discrete categories in just the same way that bivariate probits and logits are criticised for reducing a continuous variable to two discrete categories (Ravallion, 1996). When the MNL is applied to poverty dynamics, four categories corresponding to the four cells of a standard poverty transition matrix are usually employed as the dependent variable. Second, the MNL model is predicated on the assumption of the independent of irrelevant alternatives (IRR). The IRR assumption states that the odds ratios in the MNL model are independent of the other states (Greene, 1997). The validity of the IRR assumption is often highly questionable in the application of the MNL model to discrete choice issues. Third, the MNL model used unordered categorical outcomes which do not recognise the natural order of poverty transitions.

In this paper, we therefore supplement the MNL model with estimation of two alternative categorical variable models: the sequential and nested logit models. Both these models used the eight poverty dynamics categories that arise in a three wave panel (see Figure 1 below) and recognise the ordered nature of poverty transitions. The main difference between the models is that the branches and sub-branches of the sequential logit are estimated as a series of bivariate logits, while they are estimated simultaneously by the nested logit model. The nested logit model is also more computationally demanding that then sequential logit model, as it requires

the maximum likelihood estimation of eight simultaneous models for a three-wave panel.<sup>1</sup> The great advantage of these two models versus the MNL model is that they focus attention of the correlates of poverty transitions, and also allow the characteristics which trap households in poverty to be identified in a step-wise fashion.



Figure 1: Structure of the Sequential and Nested Logit Models

The multinomial, sequential and nested logit models are all subject to the serious criticism that they reduce a continuous dependent variable to discrete categories. This results in a loss of information about the dependent variable and also makes them susceptible to the influence of outliers among the independent variables (Ravallion, 1996). One possible response to this is to estimate fixed effect panel regressions using income or expenditure as the continuous variable (see for example, Woolard and Klasen, 2005). The drawback of this approach is that it only tells us about the determinants of changes in income or expenditure at the mean, which makes it difficult to establish a direct link between initial household characteristics and poverty transitions. So in this paper, we ultilise an alternative continuous variable approach: quantile regressions, to see if the influence of particular regressors differs across the expenditure distribution. Specifically, we estimate simultaneous regression models for the quantiles of the expenditure distribution corresponding to the mean expenditures of the chronically poor and never poor. This allows us discover whether the chronically poor and never poor expenditure generation functions differ, by utilising the entire expenditure distribution for estimation but weighting it differently according to the quantiles of interest. The estimation of quantile regression also makes sense if we suspects that the error terms in the expenditure equations are heteroskedastic or there are outliers in the explanatory variables (Koenker, 2005; Koenker and Bassett, 1978).

<sup>1.</sup> The sequential logit model was estimated using the Stata model SEQLOGIT (Buis, 2007) while the nested logit model was estimated using the NLOGIT suite of programs (Greene, 2007). See Henscher et al. (2005) for further details on the sequential and nested logit models.

#### 4. Transition Matrices and Contour Plots

One of the simplest way of examining the extent to which households move into and out of poverty is using transition matrices. These show the number (or percentage) of households who remain, move-out or into poverty, or remain non-poor across two years. International experience shows that relatively large number of households move into or out of poverty between years, although it is difficult to compare the amount of poverty mobility across countries because of the different time periods and welfare metrics they use (Baulch and Hoddinott, 2000; Dercon and Shapiro, 2005).

Tables 1.a to 1.c show the transition matrices constructed for the panel component of the Vietnam Household Living Standards Surveys. The number in each cell shows the number of households in each of the four poverty transition categories, with poverty identified using per capita expenditures and the GSO's poverty lines.<sup>1</sup>

			2006	
(a)	2002		Poor	Non-Poor
()	2002	Poor	560	470
		Non Poor	186	2,715
			2006	
(b)	2004		Poor	Non-Poor
(-)	2004	Poor	452	358
		Non Poor	171	3212
			2006	
(c)	2002		Poor	Non-Poor
~ /	2002	Poor	218	306
		Non Poor	67	1238

#### Table 1: Poverty Transition Matrices for Vietnam: 2002-04, 2004-06 and 2002-06

Note: These matrices are for urban and rural areas combined without weights.

The transition matrices in Tables 1(a) and (b) shows the number of panel household that were in poverty for two consecutive surveys declined from 14.2% to 10.8% between 2002-04 and 2004-06. The number of households moving out of poverty also declined from 12% in 2002-04 to 8.5% in 2004-06, while the percentage of households moving into poverty fell from 4.7% to 4.1% over the same period. The consequence of this was a substantial increase in the number of households who were non-poor in consecutive years, which rose from 6.1% in 2002 to 76.6% in 2004-06. Table 1(c) shows that over the entire 2002-06 period, 11.9% of households

<sup>1.</sup> The GSO's poverty lines for 2002, 2004 and 2006 were VND 1,916,672, VND 2,072,210 and VND 2,559,850 per person per year respectively.

were poor in both surveys, 16.7% of households moved out of poverty while 3.7% of households moved into poverty, and 67.7% of households were non-poor in both 2002 and 2006.

There are a number of well know difficulties with transition matrices. These include: (i) households are classified as being poor or non-poor based on whether their incomes (or expenditures) are above or below a pre-determined poverty line (which may or may not vary between survey years). Therefore transition matrices do not :(i) indicate how poor or welloff a household is; and, (ii) if incomes are measured with error, as is likely to be the case, some households will be erroneously classified. This is likely to be a particular problem for households with expenditures that are close to the poverty line in one or both survey years. If, for example, per capita expenditures were 10% higher in both 2002 and 2006, the number of households moving out of poverty in Table 1(c) would drop by 20% (to 244 households). Similarly, if expenditures in these years were 10% lower, the number of households moving out of poverty would increase by 13% (to 346).

Contour plots, which can be regarded as the continuous analogue of transition matrices are one way to circumvent these difficulties. Contour plots are diagrams which provide a two dimensional view of a bivariate distribution, and resemble a topological maps of a mountain.<sup>1</sup> They can be interpreted in a similar way to the contours on an topological map, except the contours represent points of equal frequency rather than points of equal height. Once horizontal and vertical lines representing the poverty lines in two survey years are super-imposed on the contour plot, its relationship to the four categories in a standard transition matrix become clear: the four partitions of the contour plot correspond to the four cells of the transition matrix. Figure 2 shows an example of a contour plot for the same panel data from Vietnam that was used to construct Table 1(c).



#### Figure 2: Contour Plot for Vietnam, 2002-2006

<sup>1.</sup> See Deaton (1997: 180-181) for further information on the construction and interpretation of contour plots.

The position of the peak of the contour plot just inside the third quadrant (and particularly close to the 2002 poverty line) shows that while many households moved out of poverty between 2002 and 2006, large numbers of households in Vietnam remain vulnerable to falling back into poverty. This finding has obvious relevance to the likely impact of the rise in food and fuel prices in late 2007-08 on poverty in Vietnam. For example, if food expenditures in 2006 are adjusted by the rise in the CPI for food and foodstuffs between December 2006 and October 2008, the number of households moving out of poverty between 2002 and 2006 falls by 45% (to 168 households while the number moving into poverty rises by 128% (to 162).

#### 5. Are the Chronically Poor also the Poorest?

A well-known question in the poverty dynamics literature is whether the chronically poor also the poorest? (Gaiha, 1989). Table 2 and Figure 3 provide a preliminary examination of this issue for Vietnam by tabulating the mean and median expenditures across the three panel years, for the eight possible poverty dynamics and then constructing box plots for these categories. In this table the chronically poor are identified as the thrice poor (PPP), which account for just under one-tenth of rural households, and whose inter-temporal mean and median per capita expenditures are significantly lower (at the 1% level) than those in the other seven poverty dynamic categories.<sup>1</sup> Note however, that the expenditures those who fell into poverty between 2002 and 2004 are statistically indistinguishable (again at the 1% level) from those who fell into poverty between 2004 and 2006.

Poverty Dynamics Category	Inter-temporal Mean Expenditure (VND millions)	Inter-temporal Median Expenditure (VND millions)	Number of households
РРР	1.801	1.836	169
PPN	2.464	2.410	100
PNP	2.458	2.485	49
PNN	3.265	3.039	206
NPP	2.370	2.343	26
NPN	3.201	3.157	50
NNP	3.127	2.970	41
NNN	6.423	5.201	1203
All	5.041	4.085	1844

#### Table 2: Mean and Median Expenditures by Poverty Dynamic Categories

Note: This figure is for urban and rural areas combined. Intertemporal mean expenditures are in 2006 VND terms and calculated across the three panel years

<sup>1.</sup> This uses the spells approach to identifying chronic poverty employed by, *inter alia*, the Chronic Poverty Research Centre (see McKay and Lawson, 2003). An alternative components approach, which classifies the chronically poor as those whose mean inter-temporal incomes are less than the poverty line, has been proposed by Ravallion (1988) and applied to China by Jalan and Ravallion (1998).

#### Figure 3: Box Plot of Inter-temporal Per Capita Expenditures by Poverty Dynamics Category



Note: 2006 poverty line in red. This figure is for rural and urban areas combined.

Further insights into the poverty of each of these groups can be gained by examining the box and whisker plots in Figure 3. These summarise the distribution of per capita intertemporal expenditures in real terms for the same eight poverty dynamic categories with the size of each box representing the interquartile range, and the 'whiskers' showing 1.5 times the interquartile range. The points above or below the 'whiskers' are usually regarded as extreme data points or outliers (Hamilton, 2006). Several features of this plot are noteworthy. First, the three groups moving out of poverty all have much more dispersed intertemporal expenditures than three groups moving into poverty, with the large number of positive outliers showing that some households have been able to move substantially above the poverty line. Second, the category with the most positive outliers is those who were non-poor in all three years suggesting that the inequality is highest among the non poor. Third, the chronically poor category has both the lowest median expenditures.<sup>1</sup> Finally, while median per capita expenditures are close to each other (and the poverty line) for all categories moving in or out of poverty, they are substantially different for the chronically poor and never poor. This provides part of the justification for the quantile regression approach used towards the end of this paper. However, before that we estimate several categorical variable models, including the commonly used multinomial logit model, to see what they can tell us about the correlates of chronic poverty and poverty transitions in rural Vietnam.

<sup>1.</sup> This is not the case in all countries. For example in rural South India, Gaiha (1989) finds that households who move into poverty have the lowest per capita incomes.

#### 6. Multinomial Logit Model

In this section, the commonly used MNL model is estimated for rural areas in the VHLSS 2002-2006 panel. Attention is restricted to rural areas because this is where the bulk of the poor in Vietnam live, and hence where the majority of households moving in and out of poverty between 2002 and 2004 are located. We also restrict attention to households whose heads have less than post-secondary education because a head having post-secondary education is an almost perfect predictor of being non-poor in both years. To avoid endogeneity (reverse causality) issues, only values of households and commune characteristics in 2002 plus regional variables are included in the model. These are supplemented by shocks at the household level (adult working days lost to illness in 2002-2004 and 2004-2006) and commune level (floods which occurred between 2002 and 2006), and which can reasonably be regarded as exogenous. To reduce the effect of outliers, we have taken the natural logarithms of the continuous variables used (household size, age of the household head, the value of assets, total agricultural land and the number of days in which working adults in the household were ill.<sup>1</sup>

Table 3 shows how well the MNL model is able to predict households' poverty dynamics category between 2002 and 2006.<sup>2</sup> Although 70% of its predictions are correct, the model does much better at predicting which households will be non-poor in both years (93%) or poor in both years (56.6%) than in predict which households move out of poverty (26.%). The MNL also has hardly any ability to predict which households move into poverty (1.7%) although this may be partly due to the relatively small number of households in this category. These differences in the model's predictive ability should be kept firmly in mind in the discussion of the correlates of poverty transition that follows.

A struct Out some se		Predicted	Outcomes	
Actual Outcomes	РР	PN	NP	NN
РР	116	37	0	52
PN	50	73	0	156
NP	11	10	1	37
NN	29	30	0	779

Table 3: Actual and Predicted Outcomes of the Multinomial Logit Model, 2002-06

Note: The MNL model was estimated using a sample of 1381 rural households

<sup>1.</sup> To avoid the problem of trying to take the log of a negative or zero number,  $1 \text{ m}^2$  of land and VND 1,000 (approx US 6 cents) worth of productive assets has been added to all the amount of agricultural land and productive assets owned by each household in the sample. Similarly, one working day lost to illness has been added to each household in the sample.

<sup>2.</sup> The MNL model has also been estimates separately for the 2002-2004 and 2004-06 panels but the results are not qualitatively different from those for the 2002-04 panel. Chow tests indicate that the vast majority of the coefficients from the MNL for 2002-04 and for 2004-06 do not differ significantly from one another (at the 5% level).

As the coefficients of the MNL logit model cannot be interpreted directly (Greene, 1997), results are reported in terms of marginal effects which show the effect of a one-unit change in a particular variable on the probability of being in a particular poverty dynamics category holding all other variables constant. These marginal effects are estimated relative to a base category which have been chosen to highlight which household and community characteristics are associated with staying in poverty (Table 4) or remaining non-poor (Table 5).<sup>1</sup> These base categories are the median values in 2002 for a poor (P) household living in the Northern Uplands whose head has not completed primary school in Table 4 and for a non-poor household living in the South-East who has completed primary school in Table 5.

Table 4 show that ethnic minority households are roughly one-fifth more likely to be poor in 2002 and 2006 and more than a quarter less likely to be non-poor in both years. <sup>2</sup> Households size and the share of children (under 15 years old) in the household in 2002 are positively associated with chronic poverty in Table 4, but also with moving out of poverty. This may reflect the effect of children growing-up and starting to work.

The effect of education on the probability of being poor and non-poor in both years is strong. Relative to households whose heads have not completed primary school, Table 4 shows that households whose heads have completed upper secondary school are a third more likely to be never poor. If their heads have completed primary and lower secondary school, this also increase the probability that the household is never poor (by one-sixth and one-quarter, respectively) although such households are also less likely to move out of poverty. Table 5 shows that households whose heads have not completed primary school are more likely to be poor in both 2002 and 2006, while those whose heads have completed lower secondary school are less likely to be so. Both tables show that households whose heads have completed upper secondary school are less likely to fall into poverty, although the sample size for this category is small.

Variable	<b>PP</b> dp/dx	<b>PN</b> dp/dx	<b>NP</b> dp/dx	NN dp/dx		Base PP
Ethnic minority	0.195	0.026 *	0.005	-0.225	***	0
Household size (log)	0.285	0.271	-0.093 ***	-0.463	***	$\log(5)$
Share of children	0.438	0.179	-0.145 ***	-0.473	***	0.5
Share of elderly	0.069	0.372	-0.037	-0.404		0
Female head	0.072	0.037	-0.039	-0.071		0
Age of Head (log)	-0.104	-0.249	0.005	0.348	**	log(41)
Age of Head squared (centered)	0.472	0.072	-0.022	-0.522	***	0.049

#### Table 4: Results from the Multinomial Logit Model, 2002-2006

<sup>1.</sup> Note that this choice of base categories also means that the marginal effects in Tables 4 cannot be directly compared with those in Table 5.

<sup>2.</sup> Coming from an ethnic minority also increases the probability of exiting poverty by about 7% in Table 5.

Variable	<b>PP</b> dp/dx	<b>PN</b> dp/dx		<b>NP</b> dp/dx		NN dp/dx		Base PP
No schooling		(	omitte	d categor	у			
Primary school	-0.097	-0.017	*	-0.034		0.148	***	0
Lower secondary school	-0.159	-0.016	***	-0.068		0.243	***	0
Upper secondary school	-0.167	-0.038	*	-0.107	***	0.311	***	0
Value of Productive assets (log)	-0.060	-0.031	***	0.002	***	0.089	***	0.963
Long-term land area (log)	0.001	0.000		0.006		-0.006		7.937
Mains electricity	-0.227	0.011	***	0.032	**	0.183	***	1
Clean Water	-0.098	-0.075		-0.017		0.189	***	0
Days lost to illness, 2004	-0.011	0.013		0.014		-0.016		$\log(3)$
Days lost to illness, 2006	-0.016	0.013		0.001		0.002		$\log(4)$
Floods in Commune	0.188	-0.026	***	0.004		-0.166	***	0
Permanent Road	-0.080	0.041	**	-0.036		0.075	**	0
Northern Uplands		(	omitte	d categor	у			
Red River Delta	-0.059	0.151	*	-0.004		-0.088		0
North Central Coast	0.219	0.005	*	-0.018		-0.206	***	0
South Central Coast	-0.157	0.000	**	0.039	**	0.118	**	0
Central Highlands	-0.067	0.161	**	-0.085		-0.010		0
South East	-0.194	-0.030	***	-0.030		0.255	***	0
Mekong River Delta	-0.197	-0.083	***	-0.065		0.344	***	0
p(y x)	0.241	0.230		0.107		0.421		
Number of observations	205	279		59		838		
Pseudo R2	0.275							
Wald chi2(72)	32189.830							
Prob > chi2	0.000							

Note: Note: marginal effects of the multinomial logit model are shown. \* significant at 10%, \*\* significant at 5%, \*\*\* significant at 1%

Variable	<b>PP</b> dp/dx		<b>PN</b> dp/dx		<b>NP</b> dp/dx		NN dp/dx	<b>Base</b> NN
Ethnic minority	0.019	***	0.050	***	0.031		-0.100	0.000
Household size (log)	0.016	***	0.095	***	0.003		-0.114	$\log(4)$
Share of children	0.021	***	0.079	***	-0.010		-0.090	0.400
Share of elderly	0.008		0.107	***	0.015		-0.130	0.000
Female head	0.004		0.017		-0.008		-0.013	0.000
Age of Head (log)	-0.009	**	-0.079	***	-0.021		0.108	log(46)
Age of Head squared (centered)	0.023	***	0.063		0.028		-0.114	0.041
No schooling	0.009	***	0.016		0.027	*	-0.052	0.000
Primary School				omitt	ed catego	ry		
Lower Secondary School	-0.004	**	-0.005		-0.016	*	0.025	0.000
Upper Secondary School	-0.004	*	-0.012		-0.031	***	0.047	0.000
Value of Productive assets (log)	-0.003	***	-0.014	***	-0.005	***	0.023	1.947
Long-term land area (log)	0.000		0.001		0.002		-0.003	7.966
Mains electricity	-0.017	***	-0.026	*	-0.005		0.049	1.000
Clean Water	-0.004	***	-0.023	***	-0.012		0.039	0.000
Days lost to illness, 2004	0.000		0.004	*	0.005	*	-0.009	0.000
Days lost to illness, 2006	-0.001		0.002		0.000		-0.002	0.000
Floods in Commune	0.013	***	0.017		0.019		-0.050	0.000
Permanent Road	-0.003	**	0.001		-0.013	*	0.016	0.000
Northern Uplands	0.047	***	0.028		0.031		-0.106	0.000
Red River Delta	0.041	***	0.094	***	0.038		-0.173	0.000
North Central Coast	0.155	***	0.070	***	0.048	**	-0.274	0.000
South Central Coast	0.008		0.015		0.038		-0.062	0.000
Central Highlands	0.034	***	0.082	***	-0.018		-0.098	0.000
South East				omitt	ed catego	ry		
Mekong River Delta	-0.001		-0.014		-0.015		0.031	0.000
p(y x)	0.008		0.044		0.031		0.917	
Number of observations	205		279		59		838	
Pseudo R2	0.275							
Wald chi2(72)	36388.890							
Prob > chi2	0.000							

Note: Note: marginal effects of the multinomial logit model are shown. \* significant at 10%, \*\* significant at 5%, \*\*\* significant at 1%

Unsurprisingly households' ownership of productive assets increases the probability of being never poor but access to long-term land does not affect the probability of moving in and out of poverty in any of the MNL models estimates. This may reflect the fact that the allocation of agricultural land in Vietnam mostly took place during the 1990s, and that there is now relatively little arable land left to be allocated or reallocated. What is more surprising is that the level of productive assets a household has appears to be negatively related to its chances of moving out of poverty in both Tables 4 and 5. This may, perhaps, be due to households using their assets to smooth consumption against shocks–which is consistent with the limited effect of shocks noted above.

Shocks at the households level have relatively little effect on household's poverty dynamic category. Days lost to sickness of working household members in both 2002-04 and 2004-06 have largely insignificant effects in Tables 4 and 5. However, shocks are the community level are more important, with floods decreasing the probability that a household is never poor by 17% and also decreasing the probability of moving of out poverty by a modest amount in Table 4.

Finally, infrastructure and facilities have relative modest effects on household poverty dynamics. The absence of mains electricity and clean water at the household level decreases the probability that a household will move out of poverty or be never poor, and increases the probability that it will remain in poverty. Living in a commune with an agricultural extension centre also increases by probability of moving out of poverty by about 7% in Table 4. However, the existence of a permanent road in the commune or a market in the commune centre does not have a strong impact of poverty dynamics. This reflects the fact that by 2002, all but the most remote communes already had roads and markets.

Finally, households from Northern Uplands and Central Highlands, where large number of the ethnic minorities live, are more likely to be chronically poor according to Table 5, while households living in the prosperous South East and Mekong River Delta are more likely to be never poor according to Table 4. Living in the Red River Delta or North Central Coast is positively associated with chronic poverty and negatively associated with being never poor in these tables. Whether there is a regional pattern for households moving into poverty is more difficult to discern, with households living in the South Central Coast and Central Highlands being more likely to move out of poverty in Table 5 compared to households in the Red River Delta, North Central Coast and Central Highlands in Table 6. This and other apparent inconsistencies in the marginal effects in Tables 4 and 5 largely reflect the failure of the MNL model to be able to distinguish between the characteristics of households moving in and out of poverty, although the model does reasonably well in discriminating between the chronically poor and never poor.<sup>1</sup>

#### 7. Sequential and Nested Logit Models

While the multinomial logit model has become the standard models used to analyse poverty dynamics, it is by no means the only model available for this purpose. The MNL model suffers from three limitations: 1) the IIA (Independence of Irrelevant Alternatives) assumption, which makes the odds ratio independent of other outcomes; 2) the IID (Independently and

<sup>1.</sup> This finding is consistent with those of Vu *et al.* (2007) for the 2002-04 rural panel.

Identically Distributed) assumptions, which does not allow heterogeneity in the variance and covariance of outcomes; and, 3) the unordered nature of its outcomes (Hensher et al., 2005). In this section, we employ two related models — the sequential and nested logit models — to try overcome these limitations and tease out the drivers of movements into and out of poverty more clearly. The sequential logit model imposes greater structure on the poverty dynamics than the unordered categories of the multinomial logit model, while the nested logit model allows some levels of heterogeneity in the variance and covariance of outcomes.

The sequential logit model consists of a series of seven logit models estimated in the order in which a Vietnamese household would naturally make poverty transitions. As shown in Figure 3 (above), these are:

1. Non-poor versus poor in 2002

2. Non-poor versus poor in 2004, given that the household was poor in 2002

3. Non-poor versus poor in 2004, given that the household was non-poor in 2002

4. Non-poor versus poor in 2006 given the household was poor in both 2002 and 2004

5. Non-poor versus poor in 2006 given the household was poor in 2002 and non-poor in 2004

6. Non-poor versus poor in 2006 given the household was non-poor in 2002 and poor in 2004

7. Non-poor versus poor in 2006 given the household was non-poor in both 2002 and 2004

As the base case in each model is one with more poverty, we therefore chose to omit the dummy variables which are most likely to be correlated with poverty. In Vietnam, these are residence in the Northern Uplands and households who head have not completed primary schooling. To reduce the effect of outliers, we have again taken the natural logarithms of the continuous variables used (household size, age of the household head, the value of assets, total agricultural land and the number of days in which working age members of the household were ill).

Table 6 shows the results of the sequential logit model, with the odds ratios (rather than coefficients or marginal effects) shown for each of the explanatory variables. For variables where the odds ratio is greater than one, this means the variable increases the probability of the household escaping poverty in the relevant transition period. When the odds ratio is less than one, the opposite is true. Column 1 shows that most of explanatory variables have a significant impact on whether or not a rural household is poor in 2002, with minority status, household size and the share of children and elderly people in the household all reducing the probability of a household escaping poverty substantially. In contrast the age of the head and the head's level of education increase the probability of a household escaping poverty, along with the (logarithm of) the value of assets. However, the amount of productive land owned does not affect the probability that a rural household is poor, again demonstrating the effectiveness of Vietnam's land reallocation programs. Whether a household has mains electricity or clean water increases its chances of moving out of poverty. As expected most of the forward looking shock variables, such as the number of days working members of the household were sick

between 2002-04 and 2004-06, do not affect the odds of poverty significantly, although the number of floods experienced in the commune in which they live (which are presumably are presumably correlated across years) do. Finally, while most of the regional dummies are significant, households living in Vietnam's booming South East, the South Central Coast and Mekong River Delta were more likely to move out of poverty in 2002, while those in the northern regions were less likely to do so.

The next two columns of Table 6 show the logits for a household escaping poverty between 2002 and 2004, given its poverty status in 2002. The most noticeable thing about these results is that the number of variables with odd ratios significantly different from one is much smaller than in 2002. The education variables, however, continue to exert a positive influence on the likelihood of moving out of poverty, while ethnic minority status increases the likelihood that a household will be poor in both 2002 and 2004. The value of assets increase the odds of households moving or staying out of poverty, but ownership of long-term land, which does not change much between years in rural areas of Vietnam, does not influence poverty significantly, but has a little impact on households that were non-poor in 2002 falling into poverty (though its odds ratio is, as expected, less than one). Living in the north again increases the probability that a household will be poor in both ears, while living the South-East improves its chances of moving out of poverty by 2004.

Table 6: Sequential Logit Model Results for Poverty Transitions, 2002-06

	2002		2004				2006			
	ΝvΡ	ΝvΡ	Ň	v P	NvP	ΝvΡ	ΝvΡ		ΝvΡ	
لامشماما		2002=P	200	2=N	2002=P	2002=P	2002=N		2002=N	
Vallaute					2004=P	2004=N	2004=P		2004=N	
Ethnic minority	0.381 ***	0.335	***	0.57	1.097	0.534	1.275		0.601	
Household size(log)	0.105 ***	0.556		1.2	0.664	1.704	29.031	*	0.629	
Share of children	0.112 ***	0.308	0	.039 ***	0.989	0.222	0.005		7.132	
Share of elderly	0.132 ***	0.964		0.16 *	57.897 ***	0.365	0.008		1.005	
Female head	0.674 *	1.311	0	.557	0.358 *	1.311	1.871		1.525	
Age of Head (log)	4.807 ***	0.782	Ŋ	.142 **	0.151 **	1.6	0.448		4.251 *	÷
Age of Head Squared (centred)	0.143 **	0.125	1	.348	0.035	9.487	0	***	3.07	
No schooling					omitted catego	·y				
Primary School	1.519 *	1.397	1	.678	1.606	0.746	0.094	*	2.505 *	÷
Lower Secondary School	1.952 ***	4.163	*** 3	.776 ***	2.706 *	1.165	0.147		6.774 *	***
Upper Secondary School	2.263 ***	2.475	*	.068 **	1.597	3.141	1.60E+08	***	5.40E+06 *	***
Value of productive assets (log)	1.425 ***	1.126	*** 1	.215 ***	1.098 *	1.193	** 0.593	*	1.201 *	**+
Long-term land area (log)	0.992	1.036		0.91	0.95	1.065	1.017		0.906	
Mains electricity	2.17 ***	2.267	0 ***	.925	2	1.429	0.963		1.547	
Clean water	2.099 ***	0.994	1	.473	1.143	0.974	4.919		1.441	

Days lost to illness, 2004	0.953		1.167	*	1.17		1.133		1.056	0.57	*	0.786 **	
Days lost to illness, 2006	0.989		0.889		0.906		1.189	*	1.253	0.1	**	1.276 *	
Floods in commune	0.582	*	0.811		0.715		0.342	*	0.466	2.95	9	0.515 *	
Permanent road	1.112		1.168		1.392		2.072	*	2.385 *	2.26	4	1.655	
Northern Uplands						om	itted ca	tegory					
Red River Delta	0.587	¥	0.373	*	1.514		4.428	*	2.642	0.14	1	0.923	
North Central Coast	0.41	* *	0.292	* *	1.069		0.653		0.89	0.28	4	1.579	
South Central Coast	1.789	+	0.876		1.891		2.875		7.448 *	0.01	1 ***	2.02	
Central Highlands	0.673		0.912		3.888		2.375		4.661 **	7.50E+0	*** 9	3.538	
South East	2.515	*	3.38	*	6.585	* **	5.562	*	4.227 *	7.80E+0	*** 9	1.599	
Mekong River Delta	3.577	***	1.212		3.623	*	6.4	***	2.738	15.35	6	5.327 *	
Number of Observations	1381		484		867		253		232	9	8	829	
Psuedo R2	0.254												
Wald Chi2 (24)	95.59												
Prob >chi2	0.000												

Note: Odds ratios. \* significant at 10%, \*\* significant at 5%. \*\*\* significant at 1%

The final four columns of Table 6 show the logits for a household escaping poverty between 2004 and 2006, given their poverty status in 2002 and 2004. Again relatively few variables influence the chances of household escaping poverty given their previous poverty history. Most of the odds ratios for the columns that shows households moving into and out of poverty are either not significantly different from zero, or have inconsistent effects across columns. Because of the smaller sample sizes, particular in the penultimate column, some of the odds ratios reported are also very large. Nevertheless, the number of workers experiencing sickness between 2004 and 2006 seems to be an important driver of households who were poor in 2004 staying in poverty. Households whose heads have completed upper and lower secondary schooling, and who lived in the Mekong Delta are most likely to be non-poor in all three years. Indeed the size of the odds ratios for upper secondary schooling are so large that they suggest it is almost impossible for a households whose head has completed secondary schooling to be poor in any of the three years. This is consistent with the access to formal sector jobs that this level of education confers in Vietnam.

We have also estimated a nested logit model using the structure shown in Figure 3. This model is more demanding to estimate that the sequential logit, and certain variables (e.g., age of household head squared, primary and secondary schooling, illness of working-age members at the household level as well as the permanent road variable) have to be modified or dropped before the model converges.<sup>1</sup> The underlying choice theoretic foundations of the nested logit model, which is usually applied to discrete choices within a utility maximization framework, are also more questionable than those of the sequential logit in a poverty dynamics context. Nevertheless, the nested logit model's results are generally consistent with those of the sequential logit model, and therefore serve as a useful check on the sequential logit results as well as multinomial logit model.

Table 7 shows the direct effects of different variables in the nested logit model. Notice that effects are only produced for seven of the eight poverty dynamics categories because the NNN category is omitted (along with no schooling and the Northern Uplands).<sup>2</sup> Ethnic minority status, household size, the share of children, the share of the elderly and coming from the North Central Coast all increase the probability of a household being chronically poor (PPP), while access to electricity and the value of assets as well as coming from the South East and Mekong River Delta reduce it. Household size increases the probability of moving into poverty (NPP and NPP) to a much smaller extent. Primary and secondary education and the value of productive assets consistently reduce the probability of experiencing poverty, but the size of their marginal effects differs substantially between categories. There are a few variables (such as ethnic minority status and mains electricity) which matter to the probability of a household being in the PPP or PPN categories but not to other categories. This suggests that these variables play a more important role in perpetuating poverty than others.

<sup>1.</sup> To obtain convergence, we have set the inclusive value parameters for PR2, P2P4, and P2NP4 equal to one. The restricted model converges normally and the restriction passes the likelihood ratio test. The log likelihood ratio statistics is 1.958 and the  $\chi 2$  (3, 0.95)) value is 7.815.

<sup>2.</sup> The total effects of all variables for all eight categories are provided in Appendix 2.

Table 7: Direct Marginal Effects of the Nested Logit Model, 2002-2006

Variable\Outcome	PPP		Ndd		PNP		NNA		ddN		NPN	NNP	
Ethnic Minority	12.206	**	9.414	* *	3.059	*	5.525		2.332		0.303	1.222	
Household size (log)	19.356	***	16.816	***	6.507	***	26.261	***	3.406		-0.250	3.511	***
Share of children	8.748		4.156		3.485		4.078		-0.649		-0.202	-9.753	***
Share of elderly	14.817	*	22.457	***	9.094	*	28.537	***	7.045		-1.978	2.834	
Female Head	-0.207		-2.591		-0.455		1.075		-2.600		1.862	-2.715	*
Age of head	-0.423	* * *	-0.486	***	-0.203	*	-0.660	* *	-0.128	*	-0.134	-0.157	***
No schooling						C	mitted cate	sgory					
Primary School	-12.851	***	-7.264	***	-3.039	*	-11.979	* *	-5.198	*	-0.029	-3.717	***
Lower/Upper Secondary school	-21.369	* * *	-14.125	***	-5.119	* * *	-14.067	* *	-6.347	* *	-2.748	-6.633	***
Value of productive assets (log)	-4.146	* * *	-2.931	***	-1.750	* *	-4.735	***	-0.782	*	-0.754	-0.633	***
Long-term land area (log)	-0.140		-0.622	*	-0.204		-0.128		-0.321		0.372	-0.360	*
Mains electricity	-10.403	***	-5.201	*	-2.000		-4.363		-1.152		0.737	-0.189	
Clean water	-8.371	* * *	-5.818	*	-3.488	*	-10.198	* *	-2.313	*	-0.892	-1.920	*
Northern Uplands						0	mitted cate	egory					
Red River Delta	3.379		10.175	* *	-1.512		4.745		3.045		-3.067	1.422	
North Central Coast	13.757	* * *	9.101	***	2.759		5.436		6.193	*	-10.869	0.770	
South Central Coast	-0.919		2.866		-5.581		0.192		5.237	*	-7.372	2.086	
Central Highlands	-1.492		4.321		-3.133		4.551				-5.059	-1.585	

Variable/Outcome	PPP	Ndd		PNP		PNN	NPP	NPN	NNP	
South East	-18.947 ***	-7.157		-5.824	*	-6.467		-6.087 *	-0.352	
Mekong River Delta	-20.558 ***	-8.180	*	-8.495 *	۱ *	20.484 ***	-9.200	-1.369	-3.656	*
			Ι	V paramete:	rs					
P2P4	1 Fixed		Z	P2P4		8.668 **		PR2	1 Fi	xed
P2NP4	1 Fixed		Z	P2NP4		29.106 ***		NPR2	0.329 *	*
Number of Observations	159	94		46		185	23	45	36	
Pseudo R-squared	0.482									
Wald Chi2 (127)	2765.852									
Prob >chi2	0.000									
	Note: Averag	ge direct effec	t (percen	ıt) calculated	l over a	ll observations in	the sample. * si	gnificant at 10%, $^{*:}$	* significant at	5%,

Taken together the results of the sequential and nested logit models demonstrate the powerful lock-in effects that initial conditions had on households' subsequent poverty transitions in Vietnam in the early 2000s. Initial conditions such as household size and composition, whether the household head comes from an ethnic minority or lived in the northern part of Vietnam played a role in trapping households in poverty. Failure of the household to complete primary education is also a powerful factor trapping households in chronic poverty, as has been observed in other countries (Rose and Dyer, 2008). In contrast, completing secondary or post-secondary education has strong effects on a household's ability to escape from poverty and to remain out of poverty once they have escaped it. This would confirm the priority which successive Vietnamese Governments have given to education, and the current focus on achieving universal lower secondary school enrolments, although challenges still remain in getting some ethnic minority children to complete primary school (Baulch et al, 2010). The value of productive assets affect only some poverty transitions — and have their strongest impact on determining whether or not a household is poor in the first place. This is linked to the gradual way in which households typically accumulate assets. Now that most communes have access to electricity, clean water and roads, investments in community infrastructure are becoming less important as drivers as poverty reductions, though they still matter to the overall economic growth. In contrast, health shocks matter to downward poverty dynamics in the 2004-06 period, but matter less in the 2002-04 period suggesting that as time passes many households are able to overcome periods of ill health. Finally, living in the (generally more dynamic and market oriented) southern part of Vietnam increases households ability to escape from (though not to remain out of) poverty. This is consistent with the higher levels of vulnerability to poverty that often accompanies market-led development.

#### 8. Determinants of Per Capita Expenditure: Simultaneous Quantile Regressions

As mentioned above, while they are informative for analysing the correlates and drivers of poverty dynamics, the multinomial, sequential and nested logit models are subject to the serious criticism that they reduce a continuous dependent variable to discrete categories. This results in a loss of information about the dependent variable and also makes them susceptible to the influence of outliers among the independent variables (Ravallion, 1996). In this section, we therefore simultaneous estimate quantile regressions to see if the influence of household and community characteristics or regional variables differs across the expenditure distribution.

Table 8 shows simultaneous quantile regression results using the logarithm of per capita expenditure in 2006 calibrated to the 8<sup>th</sup> and 67<sup>th</sup> percentiles of the distribution (corresponding to the mean expenditures of the chronically poor and never poor respectively). As with the various categorical (logit) models estimated previously, the sample is restricted to rural households only but now households whose heads have completed post-secondary education are included. To avoid endogeneity, all the regressors are initial 2002 values, except for the shock variables (adults working days lost to illness, floods in the commune) which are regarded as exogenous.<sup>1</sup> Independent variables which are seriously skewed (such as age of the head, the

<sup>1.</sup> This means that some variable which are likely to be highly correlated with per capita expenditures, such as wage employment or the presence of a migrant, are not taken account of.
value of productive land, and days lost to illness) have also been logged, while the squared age of the head has been centred to avoid multicollinearity. As the pseudo R-squared at the bottom of the table show, together these variables explain around 29 and 23 percent of the variation in per capita expenditures of the chronically poor and never poor in 2006.

The second and third columns of Table 8 show the determinants of expenditures in 2006 for the chronically poor and never poor. Ethnic minority status, household size, and the presence of floods in the commune, all have a significant negative effect on expenditures for both the chronically poor and never poor. Coming from an ethnic minority reduces per capita expenditures among the chronically poor by approximately 17 percent, while floods in the commune reduce the expenditure of both groups by around 10 percent. The head having completed secondary or post-secondary education, the household possessing mains electricity and clean water, and living in the South East or Mekong River Delta all have significant positive effects on the expenditures of both the chronically and never poor. Age has the expected declining (inverse quadratic) effect for both groups, although only one of the coefficients on age and age-squared are significantly different from zero in each quantile regression. There are also some variables which are significant determinants of expenditures for the chronically poor, but not for the never poor, and vice-versa. For example, the head having completed primary school only increases the expenditures of the chronically poor significantly, while living in the South Central Coast is associated with higher expenditures of only the chronically poor. Similarly, the share of children and elderly people in the household has a negative effect on expenditures among the never poor but not the chronically poor, while living in the Central Highlands only has a positive effect on the never poor.

Differences in the significance of variables do not, however, imply that the responsiveness of chronically poor and never poor to these variables differ statistically from each other. This is tested formally in the last column of Table 8, which shows the results of an interquantile regression for the difference between coefficients at the 8th and 67th percentiles of the expenditures distribution. The results shows that responsiveness of the chronically poor and never poor to the share of children in the household, and residence in the North Central Coast are statistically different, but that other coefficients are identical from a statistical point of view.<sup>1</sup> That the share of children in the household only has a significant negative effect among never poor households is likely to be explained by the heavier cost of education among more prosperous households, as well as the fact that children start to work (usually within the family farm or business) much earlier in poorer households (Edmonds and Turk, 2004). That residence in the North Central Coast only has a depressing effect on the chronically poor is consistent with the geographic diversity of the North Central Coast, which includes both poor, remote upland areas close to the Lao border and prosperous and well connected lowland areas along the coast. At first glance, it is surprising that ethnic minority status and residence in the Central Highlands, who coefficients differ in size by more than a factor of two, are not found to be statistically different from one another. In both cases, however, the small number of households from ethnic minority and the Central Highlands in the VHLSS panel probably explains the lack of statistical difference between these variables.

<sup>1.</sup> The coefficients on the age of head squared are also statistically different for chronically poor and never poor households. However, this is probably explained by the significant coefficient on the complementary variable for the age of the head (not squared) for the never poor only. In both cases, these two coefficients combined show the usual inverted U (quadratic) shape between expenditure and the age of head.

Variable	Chronically Poor		Never Poor		Difference	
	(8th percentile)		(67th percentile)		Difference	
Ethnic minority	-0.169	**	-0.150	***	0.019	
Household size	-0.037	**	-0.042	***	-0.005	
Share of children	-0.029		-0.439	***	-0.410	**
Share of elderly	0.065		-0.223	*	-0.288	
Female head	0.048		0.001		-0.047	
Age of Head (log)	0.160		0.244	***	0.084	
Age of Head Squared (centered)	-0.928	***	-0.090		0.838	*
Primary School	0.149	***	0.052		-0.097	
Lower Secondary School	0.321	***	0.129	**	-0.192	
Upper Secondary School	0.386	***	0.258	***	-0.128	
Post-Secondary Education	0.623	***	0.464	***	-0.159	
Value of productive assets (log)	0.063	***	0.052	***	-0.011	
Long-term land area (log)	-0.007		-0.011	**	-0.005	
Main electricity	0.156	**	0.178	***	0.021	
Clean water	0.130	***	0.117	***	-0.013	
Days lost to illness, 2004	-0.018		-0.004		0.014	
Days lost to illness, 2006	-0.001		0.031	***	0.032	
Floods in commune	-0.095	*	-0.113	**	-0.018	
Permanent road	0.015		0.087	***	0.072	
Red River Delta	0.034		-0.002		-0.036	
North Central Coast	-0.242	**	-0.117	*	0.125	**
South Central Coast	0.172	**	0.088		-0.084	
Central Highlands	0.102		0.219	***	0.118	
South East	0.398	***	0.294	***	-0.104	
Mekong River Delta	0.379	***	0.321	***	-0.058	
Constant	6.985	***	7.592	***	0.607	
N	1464		1464			
Pseudo R2	0.289		0.233			

## Table 8: Simultaneous Quantile Regressions of Per Capita Expenditure in 2006

*Note: Coefficients.* \* *p*<0.10, \*\* *p*<0.05, \*\*\* *p*<0.01

To sum-up, the simultaneous quantile regression results provide some evidence that chronically poor and never poor households in rural Vietnam have different expenditure generation functions. While many household and community characteristics have similar effects on expenditures for both groups, the chronically poor seem to be more disadvantaged by geography and ethnic minority status while changes in household size and the share of children matter more to the living standards of the never poor.

#### 9. Summary and Conclusions

This paper has provided a descriptive and multivariate analysis of poverty dynamics in Vietnam using panel data from the Vietnam Household Living Standards Surveys of 2002, 2004 and 2006. Transition matrices and contour plots confirm that while large numbers of households moved out of poverty between these years, many did not move far above the poverty line and remained vulnerable to falling back into poverty. Furthermore, around a tenth of rural households appear to be trapped in chronic poverty. Different categorical models are then estimated to analyse the correlates of chronic poverty and the drivers of poverty transitions in rural areas. Multinomial logit models show that ethnic minority households with little or no education and those living in the Northern Uplands or Central Highlands are most likely to be chronically poor. The sequential and nested logit models demonstrate the powerful lock-in effects that initial conditions had on households' poverty transitions in the early 2000s. Initial conditions such as household size and composition, whether the household head comes from an ethnic minority or failed to complete primary school, and residence in northern Vietnam play an important role in trapping households in poverty. Finally, simultaneous quantile regression models are estimated to investigate whether the chronically poor and never poor have different expenditure generation functions. While many household and community characteristics have similar effects on expenditures for both groups, the chronically poor again seem to be more disadvantaged by geography and ethnic minority status while changes in household size and the share of children matter more to the living standards of the never poor.

Taken together these results demonstrate four facets of poverty dynamics in rural Vietnam. First, certain household and geographic characteristics (such as ethnicity, lack of education, and residence in northern Vietnam) exert powerful effects which lock households into chronic poverty. Since many of these interlocking characteristics are hard if not impossible to change, they demonstrate the structural nature of chronic poverty in rural Vietnam. Second, as in many countries, education provides the foundation for many to escape from poverty (and to remain out of poverty once they have escaped it). In Vietnam, this is linked to the greater access which those with secondary and post-secondary have to wage jobs, as well as their higher propensity of educated people to migrate. It confirms the priority which successive Vietnamese Governments have given to secondary education, although challenges still remain in getting some disadvantaged children to complete primary school. It also suggests that further easing of domestic restrictions on migration may provide further opportunities for reducing rural poverty. Third, control over land appears to play a relatively minor role in the transitions from poverty. This is linked to both the growing importance of the non-farm economy in Vietnam, and the shortage of arable land available for reallocation. Other types of physical capital and community infrastructure have mixed effects on households' poverty dynamics, although access to electricity at the household level was important in allowing some households to escape

poverty. Finally, while rural households in Vietnam seem able to protect themselves against illness and other idiosyncratic shocks, floods and other covariant shocks have the potential to push many households back below the poverty line, at least temporarily. As the effects of the recent food price shocks and global economic crisis demonstrate, Vietnam's poverty reduction record remains fragile.

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## **Appendix 1: Analysis of Pattern of Attrition**

This appendix analyses the pattern of attrition in the VHLSS04-06 panel.<sup>1</sup> In particular it tests for whether household attrition is random using attrition probits (Fitzgerald et al, 1998) and pooling tests, in which the equality of coefficients from the baseline sample with and without attritors are equal (Becketti, Gould, Lillard and Welch, 1988). Note that 477 out of 4,670 households dropped out of the VHLSS panel between these years, and that the survey does not follow households who move from their original communes.

One of the simplest tests for whether attrition is random is to estimate a bivariate probit in which the dependent variables takes the value one for the households which drop out of the sample between 2004 and 2006 and zero for the remaining household. Explanatory variables are 2004 values for all variables that are used in the simultaneous quantile regression in Table 8 plus other auxiliary variables which are believed to capture the quality of the interview process or otherwise directly affect the probability of attrition. To capture the quality of the interview process we include dummy variables for whether an interviewer was needed, the interview month and how many sources of income the household has (which is a rough proxy for the length of the interview, as a separate section or sub-section of the VHLSS questionnaire is administered for each income source). We also include the type of house in which the household lives and whether the commune in which it lived experienced droughts, floods or storms, as variables which may directly affect the probability of a household dropping out of the sample.<sup>2</sup> As is usual, we also include the lagged values of the (natural logarithm) of per capita expenditure in 2004.

Table A1 shows the results of estimating the attrition probit both for the complete sample and for rural areas only. Just eight of the 44 explanatory variables included in the probits are significantly different from zero at the 1% level of statistical significance. There variables are the age of the household head squared), whether the household has access to clean water or has more than three incomes sources, and residence in the Red River Delta. In addition, living in a permanent house or in an urban area, per capita income and having two income sources have weak effects on the probability of attrition. While a joint Wald test for all these variables being significantly different from zero can be decisively rejected ( $\chi^2(17)=58.4$ ), it is important to note

<sup>1.</sup> Note that it is not possible to test for the randomness of attrition between the 2002 and 2004 waves of the VHLSS because the sample size of the VHLSS was reduced substantially between these years, and survey teams were instructed to choose three out of five potential panel households to re-interview in most communes.

<sup>2.</sup> Note that there are nine households in the panel with missing information on house type. This reduces the sample used in the attrition analysis to 4,661 households.

that the pseudo R<sup>2</sup> statistics at the bottom of the table show that only around 4% of attrition are explained by the variables included in the probit.

Another commonly used test for whether attrition is random is the pooling test due to Becketti, Gould, Lillard and Welch (1988). This involves regressing per capita expenditures from the 2004 round of a survey on the same explanatory variables, an attrition dummy, and the attrition dummy interacted with the other explanatory variables. The logarithm of per capita expenditures are the appropriate outcome variable in this case because expenditure is the key variable used to classify households' poverty transition category and is also the dependent variable in the simultaneous quantile regressions. An F-test of the joint significance of the attrition dummy and the interactions is then conducted to determine whether the coefficients from the explanatory variables differ between households who are stay-in or attrit from the panel. In this case, the test statistic produced (F(35, 1556) = 1.12) cannot reject the null hypothesis that attrition from the panel is random.

	Urban and Rural Areas		Rural Areas	
Ethnic minority	-0.111		-0.200	
Age of Head (log)	-0.013		0.177	
Age of Head Squared (centered)	0.888	***	1.031	***
Female head	0.091		0.096	
Household size(log)	0.003		-0.000	
Share of children	0.189		0.009	
Share of elderly	-0.092		-0.310	*
No schooling	omitte	ed category		
Primary School	0.010		0.030	
Lower Secondary School	-0.049		-0.128	
Upper Secondary School	-0.009		-0.103	
Post-Secondary Education	0.038		-0.117	
Value of Productive Assets (log)	-0.006		0.006	
Long-term land area (log)	0.009		0.003	
Urban	0.143	**		
Mains electricity	-0.144		-0.096	
Clean water	-0.202	***	-0.235	***
Northern Uplands	omitte	ed category		
Red River Delta	0.273	***	0.355	***

#### Table A1: Attrition Probit for 2004-06 VHLSS Panel

North Central Coast	-0.076		-0.065	
South Central Coast	-0.182		-0.134	
Central Highlands	0.084		0.066	
South East	0.153		0.077	
Mekong River Delta	0.048		0.059	
Log of expenditure per capita	0.134	**	-0.008	
Interpreter needed	0.230		0.256	
Permanent house (not shared)		omitted category		
Permanent house (shared)	-0.242	*	-0.457	**
Semi-permanent house	-0.096		-0.232	
Temporary house	-0.037		-0.162	
Interview month: May		omitted category		
Interview month: June	-0.117		-0.084	
Interview month: July	0.114		0.174	
Interview month: August	-0.129		-0.244	
Interview month: September	-0.056		-0.067	
Interview month: October	0.023		0.024	
Interview month: November	-0.013		0.183	
One income source	-0.118		-0.243	
Two income sources	-0.199	*	-0.245	
Three income sources	-0.344	***	-0.426	***
Four income sources	-0.352	***	-0.443	***
Five income sources	-0.482	***	-0.555	***
Six income sources	-0.777	***	-0.801	***
Droughts in commune	0.148		0.162	
Storms in commune	0.232		0.232	
Floods in commune	-0.126		-0.163	
Constant	-1.965	**	-1.242	
Number of observations	4661		3510	
Pseudo R2	0.045		0.041	
Wald Chi2	135.152		98.332	
P-value	0.000		0.000	

Note: coefficients of probit model, p<0.1, \*\* p<0.05, \*\*\* p<0.01

Finally, inverse probability weights are computed for the expenditure model. To do this we first calculate the predicted probabilities from the unrestricted attrition probit in Table A1, and then re-estimate it excluding the auxiliary variables that predict attrition. After calculating the predicted probabilities from the restricted attrition probit, the inverse probability weights are calculated straightforwardly by taking the ratio of the restricted to unrestricted probabilities. The inverse probability weights produced in this way vary from 0.25 to 9.63 with a mean of 1.21 for rural and urban areas combined.<sup>1</sup> When applied to the poverty transition between for 2004-06, the inverse probability weights produce the following transition matrix:

 2004
 2006

 Poor
 Non-Poor

 Poor
 462
 397

 Non Poor
 178
 3150

 Table A2: Poverty Transition Matrix 2004-05 with Attrition Weights

Which may be compared to the poverty transition matrix calculated without attrition weights in Table A3:

#### Table A3: Poverty Transition Matrix 2004-05 without Attrition Weights

		2006	
2004		Poor	Non-Poor
2004	Poor	450	356
	Non Poor	170	3211

While Table A2 has a slightly higher number of households in the PP and NP categories than Table A3, with a slightly lower number of households in the other two categories, the discrepancy between the cell frequencies is not more than about 1%.

To sum-up, the two tests we have conducted on the randomness of attrition for the 2004-2006 VHLSS panel only provide limited evidence that attrition is non-random, and when we correct for attrition using inverse probability weights we find it has a very minor impact on poverty dynamics. The main text of the paper therefore analyses poverty dynamics in Vietnam without correcting for attrition bias.

<sup>1.</sup> For rural areas alone, the inverse probability weights have the same range a slightly higher mean of 1.29.

Variable\Outcome	PPP	PPN	PNP	PNN	NPP	NPN	NNP	NNN
Ethnic Minorities	7.209	5.089	0.549	-1.415	0.695	0.042	-0.039	-12.131
Household size (log)	7.052	7.184	1.144	13.430	-0.852	-2.990	0.904	-25.872
Share of children	10.698	5.407	3.777	7.737	4.190	5.384	-10.291	-26.901
Share of elder	-0.075	13.292	3.721	15.282	2.618	-1.420	-0.339	-33.078
Female Head	1.912	-1.369	0.203	4.019	-0.477	1.738	-2.412	-3.615
Age of Head	-0.044	-0.216	-0.055	-0.265	-0.019	-0.049	-0.078	0.725
Primary School	-5.838	-0.846	0.311	-3.084	-1.917	-0.093	-1.944	13.409
Lower/Upper secondary school	-10.094	-4.009	0.286	1.403	-1.461	-0.820	-3.958	18.654
Value of Productive assets (log)	-1.750	-0.942	-0.698	-2.075	-0.189	-0.347	-0.067	6.071
Long-term land area (log)	0.283	-0.394	-0.074	0.366	0.018	0.410	-0.305	-0.304
Mains electricity	-7.641	-2.070	-0.264	0.002	-0.082	0.892	0.606	8.555
Clean Water	-3.103	-1.441	-1.208	-4.323	-0.566	-0.190	-0.701	11.531
Red River Delta	-0.614	8.379	-3.097	0.821	0.888	-2.256	0.638	-4.758
North Central Coast	9.158	4.742	0.263	-1.089	1.748	-7.652	-0.425	-6.746
South Central Coast	-1.679	2.715	-6.097	-0.746	2.157	-4.369	1.879	6.142
Central Highlands	-1.633	5.323	-3.144	6.249	-0.551	-4.081	-1.484	-0.679
South East	-14.156	-1.271	-2.827	1.741	-0.097	-4.119	1.152	19.578
Mekong River Delta	-9.997	1.856	-3.611	-7.733	-5.584	-3.764	-0.608	29.445

# Appendix 2: Total Effects (%) from the Nested Logit Model

Note: Total marginal effects over all outcome equations

# 2

# **Preserving Equitable Growth in Vietnam**

Hoang Thanh Huong Le Dang Trung Pham Thi Anh Tuyet Pham Thai Hung To Trung Thanh

#### Introduction

Since the beginning of *Doi moi* in 1986, Vietnam has been extraordinarily successful in harnessing the power of market incentives to engender rapid economic growth and due poverty reduction progress. Growth in GDP per capita between 1993 and 2006 averaged at 8.2 percent per year (GSO data), and the incidence of extreme poverty fell from nearly 60 percent to 16 percent, a rate much faster than that of China over the same period, and one of the fastest ever anywhere in the world.<sup>1</sup> But the people and the government of Vietnam want to combine economic growth - meant to improve living standards and reduce deprivation - with the preservation of equity and social cohesion, both of which have long been central to their social and political objectives.

Indeed, there is every reason to suspect that the relatively egalitarian distribution of opportunities in Vietnam since the late 1970s is partly responsible for the country's success in reducing poverty from the point market incentives were reintroduced. It has been argued, for instance, that the highly egalitarian distribution of land since the reversal of collectivization in the late 1980s enabled the vast majority of farmers to respond to the opening of agricultural markets from 1993 onwards (see Ravallion and van de Walle, 2008). Having begun with equitable distributions of assets and opportunities, the country was well-positioned to sustain inclusive, pro-poor growth.

<sup>1.</sup> These poverty rates are calculated based on data from the Vietnam Household Living Standard Surveys (VHLSSs) conducted during the period and on a poverty line of VND 1,160,000 per person per year at 1993 prices.

More recently, however, some concerns have been expressed about signs of increasing inequality in Vietnam. Although inequality in consumption expenditure has risen only modestly since the first VLSS survey in 1992/93 (from 0.34 to 0.36 in 2006), the government is concerned that these figures might not have captured the full extent of the rise in dispersion in Vietnamese society.

This background paper<sup>1</sup> prepared for the Vietnam Poverty Assessment has two objectives.<sup>2</sup> First, it aims to investigate the recent dynamics of inequality along a number of dimensions, so as to shed a more comprehensive light on what is happening to the distributions of assets, well-being and "opportunities" in Vietnam. Specifically, the report will measure and describe inequality in (i) consumption expenditure; (ii) income; (iii) landholding; (iv) educational attainments and achievements, and (v) access to basic public services.

Second, the paper seeks to understand the relationship *among* different dimensions of inequality, so as to ascertain whether inequality traps are emerging or not in Vietnam. Inequality traps, as discussed in World Bank (2006) and Bourguignon et al. (2007), are situations in which the mutually reinforcing effects of different types of inequality give rise to the emergence of subordinate groups that are permanently in a disadvantaged social position and do not share the same opportunities that are available to others.

The paper is organized as follows. Section 1 presents measures of inequality in consumption expenditures and incomes since 1993, drawing on the five household living standard surveys carried out in 1993, 1998, 2002, 2004 and 2006. Section 2 and 3 shift the focus to the distribution of assets and opportunities. Section 2 looks at the changes taking place in the distribution of education, while the section after that describes the distributions of land and access to basic public services. Section 4 then examines the relationships among these various types of inequality through the lens of "inequality of opportunity". Section 5 highlights some of the knowledge gaps that remain, and provides suggestions for additional research that might shed further light on the policy options available to the Government of Vietnam. Section 6 considers the likely policy implications of the analysis for the Government of Vietnam, and provides some concluding thoughts.

#### 1. Inequality in household welfare

Our analysis will be based on five main household surveys. The first two surveys are Vietnam Living Standards Surveys (VLSSs) implemented in 1992-1993 and 1997-1998. These surveys are similar to each other, covering household surveys, community surveys and market price surveys. For each household survey, a long and detailed questionnaire was designed, but only a relatively small sample (4800 for VLSS 92/93 and 6000 households for VLSS 97/98) was chosen. This sample size was not large enough to provide information at a level reliable enough to satisfy policy makers. In addition, the frequency of the surveys (every 5 years) is too low to allow for constant updates of information.

<sup>1.</sup> The authors would like to thank Francisco Ferreira (the World Bank) and Nguyen Thang (CAF) for their guidance and advice.

<sup>2.</sup> The 2008-2010 Vietnam Poverty Assessment, which is being prepared under the coordination of the Vietnam Academy of Social Sciences, following the tradition of VASS (2006).

The next three household living standards surveys (VHLSSs) are quite recent. GSO approved the medium term plan through 2010 which transformed the living standards survey into a biennial (once every two years) core and rotating module household survey. The content comparison across VHLSSs is presented below.

Year	Content
2002	Income and expenditure (core) + basic information of other sections
2004	Core + Land + Non-farm activities (rotating modules)
2006	Core of Health + Education (rotating modules)
2008	Core + Land + Non-farm activities
2010	Core of Health + Education

#### Table 1: Content comparison across VHLSSs

The differences among household questionnaires across the surveys are summarized in the appendix. Regarding inequality analysis, some differences between VLSS and VHLSSs' expenditure sections need to be emphasized. Specifically, VHLSSs ask for more detailed information regarding expenditure on food and drinks. Regarding non-food expenditure, the first difference between VLSS 1998 and VHLSS 2002 is the reference period, which is the previous 4 weeks in VLSSs but is the previous 12 months in VHLSSs. Moreover, items listed in the daily consumption expenditure lists in the two surveys are also different as VHLSSs collected more detailed items than VLSSs. For annual expenditure on non-food and nondrink items, VLSS 1998 collected information on 51 items while VHLSS 2002 only collected information on 48 items. Both VLSS 1998 and VHLSS 2002, however, recorded data on annual non-food expenditure in the previous 12 months. The designs of the questionnaires to collect information about durable goods in the two surveys (VLSS 1998 and VHLSS 2002) differed in two important aspects. First, VHLSS 2002 collected information on a large number of primary goods which are different from durable goods, while VLSS 1998 only collected information on expenditure on durable goods (VLSS 1998 also collected information on fixed assets, but in a separate section). Second, VHLSS 2002 added two more questions. The first question was on the purpose of fixed assets: just for living, just for production or for both living and production; while the second question (applicable if the answer was "for both purposes") is on the time period devoted to production in the last 12 months.

#	Indicator	1993	1998	2002	2004	2006
1	HH size	4.97	4.70	4.43	4.34	4.20
2	HH expenditure	6,531	12,990	15,412	19,358	24,562
3	% of household members of					
	Ages 0 to 6	16.47	10.66	9.21	7.80	7.38
	Ages 7 to 16	22.02	23.12	21.74	20.68	18.61
	Age 16 and above that are male	28.16	30.04	32.40	33.56	34.78
	Age 16 and above that are female	34.68	36.65	36.65	37.96	39.23
4	Education					
	Primary School Enrollment Rate (Net)	84.18	88.38	93.07	94.23	95.00
	Lower Secondary School Enrollment Rate (Net)	33.70	58.49	61.22	68.56	71.47
	Upper Secondary School Enrollment Rate (Net)	9.75	26.20	29.86	38.88	42.73
5	Health					
	% of rural population with access to public health services within the centre					
	% of population with health insurance and free health cards	N/A	15.67	N/A	37.51	51.00
	% with access to Infrastructure					
	% of population with access to clean drinking water	26.21	75.81	78.72	87.89	85.80
	% of population with access to clean living water	0.56	9.29		84.55	81.73
	% of population with access to hygienic latrines	18.80	66.54	47.27	52.62	58.91
6	Ownership rate of consumer durables	48.59	78.49	87.88	93.91	96.21
	% HH owning a radio	36.95	63.31	25.49	19.48	12.24
	% HH owning a TV	22.19	86.24	67.89	78.40	84.42
	% HH owning a bicycle	64.83	43.66	68.66	70.47	67.34
	% HH owning a motorbike	10.67	41.20	40.36	51.06	60.31
	% HH owning a telephone	N/A	5.84	13.43	23.66	35.48
7	Land					
	Land rented out	N/A	92.79	N/A	127.46	191.37
	Land rental	N/A	232.80	N/A	202.76	198.74

## Table 2: Household indicators, 1993-2006

As shown in Table 2, almost all socio-economic indicators of households improved from 1993 to 2006. Household size tended to decrease, dropping from nearly 5 to around 4 people. One of the main reasons why the percentage of household members of ages 0 to 6 reduced substantially is due to the rapidly growing desire of many young couples to limit themselves to two children. Household expenditure grew by five times, from VND 6.53 million in 1993 to VND 24.6 million in 2006. While household compositions changed considerably, with the most obvious change observed in the age range from 0 to 6 whose percentage decreased by over one half, from 16.47 in 1993 to 7.38 in 2006; followed by the percentage of the age range from 7 to 16 which decreased by 5.21 units. On the other hand, though, the percentage of the age range 16 and above increased by 6.62 units for males and 4.55 units for females. Changes can be easily seen in education. We can observe the development of modern life via these statistics, which include an increase of over 10 units for Primary School Enrollment Rate, an increase from 33.7 in 1993 to 77.47 in 2006 for Lower Primary School Enrollment Rate and an increase by nearly 5 times for upper Primary School Enrollment Rate from 9.75 up to 43.72.

Healthcare is the field with the greatest increase in this survey table. Health insurance and free health cards were unavailable in 1993 but already covered 51% of the population in 2006. The percentage of population with access to clean living water increased from 0.56 in 1993, to 81 in 2006. The percentage of population with access to clean drinking water and with access to hygienic latrines also remarkably increased. Parallel to these, the percentages of households owning consumer durables such as television sets, motorbikes and telephones also rose fairly, especially for telephones from to 5.84 in 1998 and 35.48 in 2006. Contrary to these, the percentage of households owning radios decreased while that of households owning bicycles dropped slightly. Land renting out rates increased from 92.79 in 1998 to 191.37 in 2006, while land rental rates decreased from 232.8 in 1998 to 198.74 in 2006. The table, despite showing large disparities in household welfare, reveals very positive improvements in household welfare.

Table 3: Household indicator comparison by top 20% - bottom 20% expenditure

	Indicator	199	ũ	199	8	200	2	20(	)4	200	96
		Bottom	Top								
	HH size	5.46	4.47	5.69	4.06	5.15	3.9	4.93	3.91	4.85	3.73
7	HH expenditure	3,013	12,273	6,253	24,499	6,728	30,750	7,831	38,949	10,153	47,126
	HH income	28,170	59,928	32,678	31,427	8,958	35,631	11,089	49,478	15,306	60,166
3	% of household members of										
	Ages 0 to 6	24.45	10.99	19.08	6.54	15.69	6.19	13.11	5.62	12.56	5.17
	Ages 7 to 16	23.2	20.09	26.83	17.74	26.06	15.31	25.94	13.78	24.05	12.45
	Age 16 and above that are male	23.28	32.51	24.49	34.4	26.35	37.54	26.72	38.2	28.52	39.2
	Age 16 and above that are female	29.74	39.57	29.75	42.14	31.89	40.97	34.23	42.4	34.87	43.18
4	Education										
	Primary School Enrollment Rate (Net)	70.31	91.67	80.12	91.74	88.27	96.39	90.07	97.58	91.48	97.89
	Lower Secondary School Enrollment Rate (Net)	15.6	53.35	33.03	86.85	40.95	75.74	53.96	82.08	55.74	85.79
	Upper Secondary School Enrollment Rate (Net)	1.06	25.21	4.45	57.58	8.31	55.24	14.2	60.73	16.35	63.26
Ŋ	Health										
	% of rural population with access to public health services within the centre										
	% of population with health insurance and free health cards			6.21	28.85	NA	NA	43.46	46.11	65.16	56.17
	% of population with access to clean drinking water	9.39	51.31	60.64	88.75	60.81	92.6	74.37	96.98	67.34	96.09

	% of population with access to clean living water	0	0.66	5.97	7.93	NA	NA	70.29	95.75	63.47	94.32
	% of population with access to hygienic latrines	5.04	44.01	52.95	82.57	18.51	81.4	20.05	87.41	25.34	89.89
	% of population using electricity as a main source of lighting	25.54	73.31	53.41	96.01	68.42	97.92	82.78	90.06	88.69	99.42
9	Ownership rate of consumer durables										
	% HH owning a radio	19.01	56.84	36.42	84.99	19.13	31.89	13.99	22.61	8.68	16.8
	% HH owning a TV	2.63	54.49	65.29	97.51	31.26	92.55	45.4	96.09	57.31	96.69
	% HH owning a bicycle	47.65	73.5	36.41	62.74	59.28	62.81	61.89	62.58	62.38	57.12
	% HH owning a motorbike	0.69	34.93	35	62.67	6.44	79.27	13.97	84.24	23.01	86.78
	% HH owning a telephone	NA	NA	0.62	13.17	0	47.52	0.14	69.28	1.38	81.48
$\sim$	Land										
	Land rented out	NA	NA	60.16	160.43	NA	NA	67.07	173.74	119.04	262.57
	Land rental	NA	NA	161.67	133.65	NA	NA	218.04	74.95	203.53	211.53

Table 4: Household indicator comparison by top 20% - bottom 20% income

	Indicator	199	33	19	98	200	2	20(	14	200	)6
		Bottom	Top	Bottom	Top	Bottom	Top	Bottom	Top	Bottom	Top
-	HH size	4.57	5.8	4.21	5.45	4.99	3.97	4.9	3.91	4.66	3.74
0	HH expenditure	6,023	9,143	16,151	15,792	7,648	28,727	8,998	36,017	11,522	43,122
	HH income	2,063	193,900	2,552	134,229	7,148	40,307	9,213	53,909	12,296	68,084
З	% of household members of										
	Ages 0 to 6	18.54	12	10.98	7.75	14.24	6.62	12.23	5.97	11.31	5.56
	Ages 7 to 16	19.08	27.92	18.18	27.3	26.88	15.77	26.66	14.43	24.33	13.34
	Age 16 and above that are male	25.99	28.92	29.62	32.46	26.61	37.52	26.73	38.36	28.51	39.65
	Age 16 and above that are female	38.16	32.09	41.84	32.86	32.27	40.09	34.38	41.24	35.86	41.45
4	Education										
	Primary School Enrollment Rate (Net)	70.3	92.79	84.18	90.26	89.05	95.57	89.43	96.29	92.41	97.94
	Lower Secondary School Enrollment Rate (Net)	28.85	41.52	58.61	59.79	47.18	75.54	54.86	77.23	60.25	83.46
	Upper Secondary School Enrollment Rate (Net)	9.79	11.71	36.34	24.28	12.6	48.42	20.58	57.56	26.65	59.16
Ŋ	Health										
	% of rural population with access to public health services within the centre										
	% of population with health insurance and free health cards	NA	NA	17.09	16.5	NA	NA	43.23	43.97	64.46	55.25
	% of population with access to clean drinking water	29.47	29.84	75.79	70.18	64.63	90.12	74.96	96.11	71.3	95.01

	% of population with access to clean living water	0	1.34	7.96	9.58	NA	NA	70.34	94.82	66.48	92.86
	% of population with access to hygienic latrines	23.06	21.19	66.61	61.96	23.95	75.27	22.21	84.25	28.52	85.09
	% of population using electricity as a main source of lighting	50.14	52.38	82.81	75.75	72.49	96	84.06	98.28	89.99	98.87
9	Ownership rate of consumer durables										
	% HH owning a radio	26.7	52.01	62.22	70.47	19.15	30.97	15.23	23.25	8.79	16.55
	% HH owning a TV	22.97	36.18	83.44	91.9	37.4	90.22	48.76	95.26	60.15	96.73
	% HH owning a bicycle	52.54	75.15	51.34	47.85	60.28	62.11	63.3	62.73	63.92	57.85
	% HH owning a motorbike	13.49	15.83	52.36	42.58	9.86	75.06	18.36	81.32	26.68	83.86
	% HH owning a telephone	NA	NA	5.75	11.47	0.77	42.72	1.12	63.3	3.28	76.07
$\sim$	Land										
	Land rented out	NA	NA	125.4	100.2	NA	NA	83.73	197.81	171.25	312.98
	Land rental	NA	NA	27.55	513.91	NA	NA	218.4	168.05	178.94	276.96

The ratios shown in Table 3 illustrate household indicator comparisons by top 20 percent bottom 20 percent expenditure. Household size expanded from 4. to 5. Household expenditure tripled from 1993 to 2006. Household income increased 7 times during this period. Household composition experienced both directions of change: the percentages of members of ages 0 to 6 and ages 7 to 16 decreased but the percentage of members (both male and female) of ages 16 and above increased slightly. This shows that childbirth rates measurably decreased in these 13 years. Education increased across all groups, which also means that academic standards improved. Household expenditure in healthcare also increased across all groups. The percentages of households owning television sets, motorbikes and telephones all increased but the percentages of households owning radios and bicycles decreased. Land renting out rates doubled, but decreased by nearly a quarter.

Household indicator comparisons by top 20 percent - bottom 20 percent income in Table 4 are dissimilar to the corresponding ones by top 20 percent – bottom 20 percent expenditure in Table 3 in some places. Household expenditure increased from 3. to 5. Household income for the top 20 percent doubled from 1993 to 2006. The percentage of household members in the top 20 percent of ages 0 to 6 decreased from 18.54 in 1993 to 5.97 in 2006, while the percentage of those of ages 7 to 16 increased from 1993 to 2002 but decreased in 2004 and 2006. The percentage of those of ages 16 and above (both male and female) also increased. It shows that the working age rose. Fewer and fewer young people had to work for money thus more and more young people can afford time to go to school. The overall view shows that education rate increased from 38.16 in 1993 to 41.24 in 2006. The most obvious change is observed in the Upper Secondary School Enrollment Rate, which increased from 28.85 in 1993 to 72.23 in 2006. This indicates that the education level positively increased. Parallel to these, healthcare rate increased considerably from 9.79 in 1993 to 57.56 in 2006 for the top 20 percent. The percentages of households owning radios, bicycles, motorbikes and telephones all increased. The change is most apparent in the case of telephones with a percentage of 13.49 in 1993 which increased to 81.32 by 2006 thanks to increasing demand for communication facilities following the nation's economic development. The rate of land-related activities increased remarkably for the top 20 percent from 5.75 in 1993 to 63.3 in 2006, with land rental rates increasing faster than land renting out rates. The former increased by 6 times from 1993 to 2006 while the latter only increased from 125.4 to 197.81 for the top 20 percent during the same period.

	1993	1998	2002	2004	2006
Total	0.33	0.35	0.37	0.37	0.36
Urban	0.34	0.34	0.35	0.33	0.33
Rural	0.28	0.27	0.28	0.29	0.3

#### Table 5: Gini Index for Per Capita Expenditure

Source: Calculations based on data from VLSS 1992/93, VLSS 1997/98, VHLSS 2004, and VHLSS 2006

Table 5 presents consumption-based Gini index as a commonly used measure of inequality. As shown in the table, the Gini index in urban areas was consistently higher than that in rural ones. Further examination reveals that while the Gini index in rural areas increased modestly,

that in urban areas decreased slightly. As a result, the gap between rural and urban inequality was narrowing (in 2006 rural inequality was 0.30 as compared to urban inequality, 0.33). As explained in Vietnam Poverty Update 2006, part of the explanation for this phenomenon may be found in examining migration patterns, of which rural to urban migration in particular increased remarkably over the decade. Such a migration pattern is one of the causes of the significantly higher Gini index of per capita household expenditure in migrants-sending areas as compared to in areas without out-migration.

	1993	1998	2002	2004	2006
Urban	0.19	0.19	0.21	0.19	0.18
Rural	0.13	0.12	0.13	0.14	0.15
Total	0.18	0.20	0.22	0.22	0.21
Between rural and urban	0.04	0.06	0.07	0.07	0.05
Within rural and urban	0.14	0.14	0.15	0.15	0.16
Between regions	0.02	0.04	0.04	0.04	0.03
Within regions	0.15	0.16	0.18	0.18	0.18
Sources of inequality (%)					
Total	100.00	100.00	100.00	100.00	100.00
Between rural and urban	21.17	31.98	33.77	31.12	24.73
Within rural and urban	78.83	68.02	66.23	68.88	75.27
Between regions	13.15	20.41	16.92	17.53	13.61
Within regions	86.85	79.59	83.08	82.47	86.39

#### Table 6: Theil L Index of Inequality 1993-2006

Source: Calculations based on data from VLSS 1992/93, VLSS 1997/98, VHLSS 2004, and VHLSS 2006

An analysis of the Theil L inequality index is helpful in providing insights into causes of overall inequality. In the 1993-1998 sub-period, inequality *between* rural and urban areas increased from 21.17 percent to 31.98 percent, while that *between* regions increased from 13.15 to 20.41 percent. At the same time, inequality within regions, although decreasing, was the main source of overall inequality. The situation in the 2002-2006 sub-period was opposite. In this period, both inequality *between* urban and rural areas and inequality between regions decreased while inequality *within* regions increased. As a result, in 2006, inequality between urban and rural and that within regions accounted for 75.27 percent and 86.39 percent of overall inequality respectively.

## 2. Inequality in educational attainments and achievements

#### Years of schooling

We draw Lorenz curves for those who actively participate in labor market and in working age by years of schooling for each year. The shape of the Lorenz curves shows that the magnitude of education inequality for each year was not high. More importantly, it shows that there was almost no change in distribution of education in Vietnam's labor force. It may have been due to several reasons. First, it could have been due to the education variables chosen here. Except for VLSS 1998 which had detailed questions on education, other VHLSSs only asked for information on the highest education degrees household members had achieved. Neither did VHLSSs ask for information on second degrees. Thus, "years of schooling" calculated here may not truly reflect the time household members actually spent on their education. Second, it could have been due to the education policy that primary education is compulsory and free of charge to all.



#### Figure 1: Lorenz curves for years of schooling, 1993-2006

Source: Calculations based on data from VLSS 1992/93, VLSS 1997/98, VHLSS 2004, VHLSS and 2006

#### Access to Education

Over the past decade, Vietnam was able to steadily improve enrolment rates. In 2006, the primary school enrolment rate was 95 percent, an improvement from 84 percent in 1993. Enrolments at the secondary education level displayed even more impressive growth. Net lower secondary school enrolment rate rose from only 34 percent in 1993 to 71.5 percent in 2006. The corresponding figures for the upper secondary education level were 9.8 percent and 42.7 percent in 1993 and 2006 respectively. Vietnam is now among the countries with relatively high educational opportunities for children as compared to regional countries (see Figure 2). Vietnam is then a good example of a country that has followed a disciplined linear approach: focusing firstly on the primary education level, next on lower secondary school access, and now addressing key policy issues to improve learning outcomes.



#### Figure 2: Net Enrolment Rates in Some Selected Countries (%)

Source: Data in 2006: Millennium Development Goals Indicators (<u>http://mdgs.un.org</u>) and authors' own calculations based on data from VHLSS in different years; Data in 2005: Human Development Report, 2007/2008

However, Vietnam's achievements in this field seemed unsustainable over time and inequality in access to schools still seemed to be a big problem. In addition to differentials in the quality of education provided, which are not measured in VHLSS; access to education, especially in high levels, also exhibits large gaps across different groups and cycles.

#### Inequality between urban and rural areas

Thanks to an intensive program to universalize primary education, there was not much difference in net primary enrolment rates in urban and rural areas. However, this is not the case for higher education levels, especially the upper secondary school level. Although net enrolment rate has increased substantially in rural areas from 1993 to 2006, in 1998 and 2000 this rate was still only a half of that in urban areas. This ratio then increased to two thirds in 2004 and 2006. In 2006, 30 percent of rural children dropped out of school before completing lower secondary school and about 60 percent dropped out before completing upper secondary school. The bottlenecks in higher education levels were much tighter in rural areas.

Table 7: Net Enrolment Rates (1993 –2006)

	4	rimary	School	Enrolm	ent Rate		Lowei	r Second	lary Sch	nool Enr	rolment	Rate	Upper S	econdar	y School	Enrolme	ent Rate
	1993	1998	2000	2004	2006	2008	1993	1998	2000	2004	2006	2008	1993	1998	2000	2004	2006
Total	84.2	88.4	93.1	94.2	95	94.68	33.7	58.5	61.2	68.6	71.5	74.21	9.8	26.2	29.9	38.9	42.7
By area																	
rural	82.4	87.8	92.4	93.9	94.3	94.03	30.7	54.3	58.7	66.5	69.8	72.34	7.1	20.4	25.3	35.1	38.8
urban	94	91.5	96.1	95.6	97.5	96.78	48.5	78.4	71.7	76.3	77.4	80.05	20.7	48.9	49	52.6	56
By region																	
Red River Delta	92.2	95	97.8	98.5	97.7	98.59	51.7	80.9	72.6	77	78.4	81.34	15.9	43	40.8	51.4	56.2
North East	81.3	90.3	94.4	94	95.3	95.3	25.6	49.6	62	74.4	77	79.17	6.3	22.3	30.7	39.6	41.4
North West	87.3	91.6	83.1	88.6	87.4	86.97	25	50.8	41.1	48.3	47.4	62.31	10.3	10.1	18.2	13.1	28.6
North Central Coast	90.4	92.2	95.3	95.2	96.9	96.73	33.5	62.9	67	72	75.1	78.49	6.9	27.9	32.1	44.2	47.4
South Central Coast	86.3	85.7	95.8	97.8	95.8	96.56	49.6	62.3	65.8	73.5	75.4	76.94	18	32.3	31.1	45.2	45
Central Highlands	73.2	70	89	89.7	94.1	93.19	37.9	42.1	45.3	58.7	64.8	64.94	2.5	9.8	17.4	27.5	34.8
South East	83.6	86.3	92	93.4	94.8	94.13	29.7	63.4	64	67.6	72	74.28	10.4	28.3	34.1	43.2	45.5
Mekong River Delta	75.9	83	88.7	91.5	92.5	90.84	22.9	41.3	49.4	58.8	63.1	63.42	5.4	15.4	18.4	23.5	27.8
By gender																	
Male	83.2	88.2	92.9	94	94.9	94.99	32.9	57.3	60.6	68.1	70.9	73.84	8.8	24.2	29.2	36.6	42.3
Female	88.8	89.3	94	95.3	95.3	93.39	36.8	64.2	64.1	70.5	74.1	75.77	12.8	33.3	33.1	48.5	44.7
By ethnicity																	
Kinh/Hoa	88.4	91	94.7	95.8	96.5	95.81	36.8	63.3	65	71.7	75.2	76.39	10.9	29.3	32.5	41.9	46.3
Ethnic minorities	60.5	75.7	84.5	86.3	88	89.32	11.7	32.2	37.7	50.3	52.9	62.42	1.9	7	12.5	19.7	21.4

#### *Inequality by ethnicity*

Ethnicity differentials in enrolments are also substantial. Big gaps in net enrolment rates in lower and upper secondary levels can be observed throughout the years and this inequality did not improve over time (see Figure 3). The enrolment rate in the lower secondary level in ethnic minorities was only two thirds of that in the Kinh/Hoa group in 2004 and 2006. This ratio was even lower in the upper secondary level, only a half. In 2006, as much as 47 percent and 80 percent of children in the former group did not have access to lower and upper secondary schools respectively, significantly higher than the 38 percent and 54 percent of children in the latter group. Furthermore, while the gap between enrolment rates across education levels in the Kinh/Hoa group tended to decrease over time, it tended to widen in the minorities, implying that ethnic children faced many more difficulties in accessing higher education. The door to higher education levels seemed to be much further out of reach for minority groups.



#### Figure 3: Net enrolment rates by ethnicity (%)

Source: Calculations based on data from VLSS 1992/93, VLSS 1997/98, VHLSS 2004, and VHLSS 2006

#### Inequality by gender

Inequality in educational opportunities was much slighter by gender. No huge differentials in net primary and lower secondary enrolment rates were seen between the two genders over time. Only a modestly higher enrolment rate for girls was observed in the upper secondary level, especially in 2004 – 12 percent higher than that for boys, and 1998 – 9 percent higher; however, the gap narrowed down significantly in 2006 – only 2.4 percent higher.

#### Inequality by region

The regional inequality of access to schools has recently become a big issue. In 2006, for example, net enrolment rates in primary education ranged from 87.3 percent in the North West to 97.7 percent in the Red River Delta. At the lower secondary level, net enrolment rates ranged from 47.4 percent to 78.4 percent and at the upper secondary level, from 28.6 percent to 56.2 percent in corresponding locations.



#### Figure 4: Average net enrolment rates (%) by regions over 1993 – 2006

Source: Calculations based on data from VLSS 1992/93, VLSS 1997/98, VHLSS 2004, and VHLSS 2006

Figure 4 shows that access to education was generally unequal across different regions in the country. The Red River Delta had the highest enrolment rates for all education levels in all years of analysis, while the lowest enrolments were observed in the North West, the Central Highlands and the Mekong River Delta areas. Children in these regions faced serious obstacles in accessing secondary education. As much as 82.5 percent and 54.4 percent of children of schooling age did not have opportunities to access upper and lower secondary education respectively; whereas the corresponding figures in the Red River Delta were 59.5 percent and 28 percent.

These huge gaps exist regardless of how poor the regions are. Most of the children in the North West, the poorest region in the country, dropped out of schools from as early as secondary level; but the same problem could also be seen in the Mekong River Delta, which is a more affluent area than some other regions such as the Central Highlands or the North Central Coast. This implies that inequality in education may be subjected to not only income differences but also other factors related to specific characteristics of the regions, which should be investigated further.

#### Inequality by education level and occupation of household heads

Educational opportunities for children much depends on the education level of household heads. As illustrated in Table 8, the higher the education level of household heads, the higher the net enrolment rates of their children. This gap is recognizable to a large extent in secondary education. In the lower secondary level, access to schools for those living in households with heads without education was especially difficult: as much as nearly half of this group dropped out of school before completing this level (in 2006), as compared to only 15-20 percent in the group living in households with heads having finished secondary or higher education. The limited opportunity to access upper secondary education also applied to children in households with having finished only primary education or lower. In 2006, the net enrolment rates of children in this group ranged from one third to a half of those of children living in households with heads having finished upper secondary education.

Table 8: Net Enrolment Rates by Education and Occupation of HH Heads (%)

		rimary	School	Enrolm	ent Rat	<u>ى</u>	Lower	· Second	lary Sch	ool Em	olment	Rate	Upper S	econdar	y School	Enrolme	nt Rate
	1993	1998	2000	2004	2006	2008	1993	1998	2000	2004	2006	2008	1993	1998	2000	2004	2006
By education level of HH head																	
No education	55	60.7		87.9	89.3	89.17	13.3	20.8		49.9	53.7	57.71	3.6	8.1		18.5	20.3
Lower than primary education	77.1	100	87.3	85.7	94.4	100	21.3	38.3	42.2	53.1	71.8	65.07	3.8		12.4	23.7	24
Primary education	86.9	87.7	94.1	96.5	97.4	94.65	30.7	47	58.4	6.99	69.7	71.73	8.7	14.3	23.6	33.9	32.1
Lower secondary education	89.9	92.1	96	96.7	96.5	97.49	45.6	74.9	72.5	76.9	79.1	81	11.2	37.2	35.7	45.4	52.3
Upper secondary education	90.8	94.1	96.4	96.4	97	97.98	61.5	78.4	77	77.8	84.3	85.86	25	54.9	55.3	53.9	61
Vocational training	95.9	93.1	97.7	97.5	97.7	98.99	47.9	75	77.9	82.4	85.3	88.09	18.3	44	64.6	61.6	69.4
College, university and above	100	93.3	94.6	99.3	99.2	99.07	65.9	85.2	78.4	86.5	85.3	87.16	59.5	70.6	68.1	67.3	65.7
By occupation of HH head																	
Agriculture	81.4	86.8	92.6	92.3	93.8	93.62	29.7	52.6	51.6	64.6	67.9	69.88	6.3	20	14.8	31	35.2
Industry	93.9	92.2	95	97.9	96.4	97.15	47.1	68.4	59.7	74.4	75.1	78.8	12.8	32.9	21.8	46.6	49.9
Services	9.06	92.4	93.5	95.7	96	96.48	47.4	75	64.8	75.2	77.6	82.83	24.6	42.6	33.2	54.9	56.9
Not working	88.5	86.1	93	94.3	96	90.74	29.9	53.5	61.6	64.6	68.5	70.56	9.8	32.5	30.6	34.1	38.6

Significant differences in net enrolment rates can be observed across sectors of occupation of household heads. Children with parents working in the industry sector or the service sector were likely to have more opportunities to access higher education while those with parents working in the agriculture sector or not working tended to have more limited access.

#### Inequality by income

In Table 9, net enrolment rates are presented according to different income quintile groups. The result implies that children of the poor dropped out of schools earlier, which can potentially create an inequality trap.

Although the secondary enrolment rates in the poor quintiles (quintiles 1 and 2) were growing fast, they remained too low overall. Enrolment rates could be observed to increase from the first quintile to the fifth. However, large differentials were exhibited in the secondary education level. In 2006, lower secondary net enrolment rate in the richest quintile was 54 percent higher than that of the poorest quintile, while upper secondary net enrolment of the richest quintile was nearly four times that of the poorest one (see Figure 5). Figure 5 also shows that while nearly all children finished primary schools, large percentages of those belonging to poorer income groups dropped out before completing upper secondary school, implying that the poor were virtually locked out of higher education.

## Figure 5: Net Enrolment Rates (%) by Income Quintiles in 2006



Source: Calculations based on data from VHLSS 2006

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1998         2000         2004         2006           23         41         64         2006	1993         1998         2000         2004         2006	2008         1993         1998         2000         2004         2006	2006     2008     1993     1998     2000     2004     2006       2005     2005     200     2004     2006     2006	2004         2006         2008         1993         1998         2000         2004         2006	2000         2004         2006         2008         1993         1998         2000         2004         2006	1998         2000         2004         2006         2008         1993         1998         2000         2004         2006	1993         1998         2000         2004         2006         2008         1993         1998         2000         2004         2006           70.3         80.1         88.3         90.1         91.5         90.6         15.6         3.3         41         5.4         56.7
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70 / CC FC 14 CC	15.6 33 41 54 55.7 59.	90.6 15.6 33 41 54 55.7 59.	91.5 YU.0 15.6 33 41 15.6 9.5 9.6 20 20 20 20 20 20 20 20 20 20 20 20 20	90.1 91.5 90.6 15.6 33 41 54 55.7 59.	88.3 90.1 91.5 90.6 15.6 33 41 54 55.7 59.	80.1 88.3 90.1 91.5 90.6 15.6 33 41 54 55.7 59.	
51 58.4 66.2 70 75.35	21.4 51 58.4 66.2 70 75.35	96.39 21.4 51 58.4 66.2 70 75.35	95.3 96.39 21.4 51 58.4 66.2 70 75.35	95.2 95.3 96.39 21.4 51 58.4 66.2 70 75.35	93.5 95.2 95.3 96.39 21.4 51 58.4 66.2 70 75.35	90 93.5 95.2 95.3 96.39 21.4 51 58.4 66.2 70 75.35	85.1 90 93.5 95.2 95.3 96.39 21.4 51 58.4 66.2 70 75.35
62.9         66.9         73         76.3         77.46         5.9	35.5 62.9 66.9 73 76.3 77.46 5.9	94.94 35.5 62.9 66.9 73 76.3 77.46 5.9	96.8 94.94 35.5 62.9 66.9 73 76.3 77.46 5.9	95.9 96.8 94.94 35.5 62.9 66.9 73 76.3 77.46 5.9	94.3 95.9 96.8 94.94 35.5 62.9 66.9 73 76.3 77.46 5.9	91 94.3 95.9 96.8 94.94 35.5 62.9 66.9 73 76.3 77.46 5.9	87.7 91 94.3 95.9 96.8 94.94 35.5 62.9 66.9 73 76.3 77.46 5.9
66.8 70.9 75.4 80.1 83.86	42.6 66.8 70.9 75.4 80.1 83.86	96.01 42.6 66.8 70.9 75.4 80.1 83.86	971 9601 476 668 709 754 801 8386	961 971 9601 426 668 709 754 801 8386	96.6 96.1 97.1 96.01 42.6 66.8 70.9 75.4 80.1 83.86	93.8 96.6 96.1 97.1 96.01 42.6 66.8 70.9 75.4 80.1 83.86	91.9 93.8 96.6 96.1 97.1 96.01 42.6 66.8 70.9 75.4 80.1 83.86
66.8 70.9 75.4 80.1	42.6 66.8 70.9 75.4 80.1	96.01 42.6 66.8 70.9 75.4 80.1	97 1 96 01 47 6 66 8 70 9 75 4 80 1	961 971 96.01 42.6 66.8 70.9 75.4 80.1	96.6 96.1 97.1 96.01 42.6 66.8 70.9 75.4 80.1	93.8 96.6 96.1 97.1 96.01 42.6 66.8 70.9 75.4 80.1	91.9 93.8 96.6 96.1 97.1 96.01 42.6 66.8 70.9 75.4 80.1
62.9 66.9 73 66.8 709 75.4	35.5         62.9         66.9         73           47.6         66.8         70.9         75.4	94.94         35.5         62.9         66.9         73           96.01         47.6         66.8         70.9         75.4	96.8         94.94         35.5         62.9         66.9         73           97.1         96.01         42.6         66.8         70.9         75.4	95.9         96.8         94.94         35.5         62.9         66.9         73           96.1         97.1         96.01         42.6         66.8         70.9         75.4	94.3         95.9         96.8         94.94         35.5         62.9         66.9         73           96.6         96.1         97.1         96.01         42.6         66.8         70.9         75.4	91         94.3         95.9         96.8         94.94         35.5         62.9         66.9         73           93.8         96.6         96.1         97.1         96.01         42.6         66.8         70.9         75.4	87.7         91         94.3         95.9         96.8         94.94         35.5         62.9         66.9         73           91.9         93.8         96.6         96.1         97.1         96.01         42.6         66.8         70.9         75.4
51         58.4           62.9         66.9           65         70.0	21.4     51     58.4       35.5     62.9     66.9       47.6     66.8     70.0	96.39         21.4         51         58.4           94.94         35.5         62.9         66.9	95.3         96.39         21.4         51         58.4           96.8         94.94         35.5         62.9         66.9	95.2         95.3         96.39         21.4         51         58.4           95.9         96.8         94.94         35.5         62.9         66.9           95.1         97.1         97.1         96.01         47.6         66.9	93.5         95.2         95.3         96.39         21.4         51         58.4           94.3         95.9         96.8         94.94         35.5         62.9         66.9	90         93.5         95.2         95.3         96.39         21.4         51         58.4           91         94.3         95.9         96.8         94.94         35.5         62.9         66.9           91         94.3         95.9         96.8         94.94         35.5         62.9         66.9	85.1         90         93.5         95.2         95.3         96.39         21.4         51         58.4           87.7         91         94.3         95.9         96.8         94.94         35.5         62.9         66.9           91         94.3         95.9         96.8         94.94         35.5         62.9         66.9
51 62.9	21.4 51 35.5 62.9	96.39 21.4 51 94.94 35.5 62.9	95.3         96.39         21.4         51           96.8         94.94         35.5         62.9	95.2         95.3         96.39         21.4         51           95.9         96.8         94.94         35.5         62.9	93.5     95.2     95.3     96.39     21.4     51       94.3     95.9     96.8     94.94     35.5     62.9	90         93.5         95.2         95.3         96.39         21.4         51           91         94.3         95.9         96.8         94.94         35.5         62.9	85.1     90     93.5     95.2     95.3     96.39     21.4     51       87.7     91     94.3     95.9     96.8     94.94     35.5     62.9
	21.4 21.4 35.5	90.6 15.6 96.39 21.4 94.94 35.5	91.5 90.6 15.6 95.3 96.39 21.4 96.8 94.94 35.5	90.1         91.5         90.6         15.6           95.2         95.3         96.39         21.4           95.9         96.8         94.94         35.5           961         97.1         96.01         47.6	88.3         90.1         91.5         90.6         15.6           93.5         95.2         95.3         96.39         21.4           94.3         95.9         96.8         94.94         35.5           96.6         96.1         97.1         96.01         47.6	80.1         88.3         90.1         91.5         90.6         15.6           90         93.5         95.2         95.3         96.39         21.4           91         94.3         95.9         96.8         94.94         35.5           93.8         96.4         96.3         96.34         35.5	85.1         90         93.5         95.2         95.3         96.39         21.4           87.7         91         94.3         95.9         96.8         94.94         35.5           91         94.3         95.9         96.8         94.94         35.5

In further investigation into education inequality by income, Table 10 represents net enrolment rates by selected percentiles, thus showing the severe inequality in higher education. Although almost all children of all income groups had equal access to primary education, the opportunity to access secondary education seemed much more difficult for those belonging to the poorest percentiles. The ratios in the upper half of the distribution are observed to be significantly higher than those in the bottom half of the distribution, thus implying that education inequality was more serious among poorer groups, especially families in the poorest 10 percent. As a result, in 2006, upper secondary school enrolment rate of the richest 10 percent was seven and a half times that of the poorest 10 percent, thereby widening the inequality gap.

Figure 6 illustrates the concentration curves for education expenditure against household consumption for each survey year. Large deviations from the 45 degree lines in the concentration curves of all years imply that poorer households were highly likely to refrain from spending on education for their children while richer households tended to increase their concentration of expenditures. This unbalanced spending distribution indicates an increasing inequality of educational opportunities. In addition, as shown in Figure 6, the distance between the 45 degree line and the concentration curves tended to narrow down over time but not significantly, thus implying that education inequality did not improve much over time. Table 10: Net Enrolment Rates by Selected Percentiles of Expenditure Distribution

	Pri	mary Sch	iool Enro	lment R	ate	Lower S	econdary	v School	Enrolme	nt Rate	Upper S	econdar	y School	Enrolme	nt Rate
	1993	1998	2000	2004	2006	1993	1998	2000	2004	2006	1993	1998	2000	2004	2006
p10	79.5	83.6	87.8	87.4	90.9	17.8	26.6	34.6	48.3	47.8	1.5	3.4	5.5	6.5	8.3
p25	84.9	88.0	94.5	96.2	94.0	11.9	44.4	52.9	54.3	65.7	0.0	4.1	13.2	24.1	26.2
p50	87.3	90.06	95.7	96.4	95.3	37.2	57.5	69.0	73.8	73.7	2.2	17.1	23.9	33.2	43.5
p75	95.1	92.9	96.7	96.3	97.1	42.4	65.4	69.8	74.4	84.6	12.9	36.8	40.2	46.1	45.0
06d	93.6	95.0	97.0	98.1	97.3	50.5	85.6	71.7	82.3	85.6	23.1	47.0	50.8	53.2	63.7
Lower half of the distribution															
p25/p10	1.1	1.1	1.1	1.1	1.0	0.7	1.7	1.5	1.1	1.4	0.0	1.2	2.4	3.7	3.1
p50/p25	1.0	1.0	1.0	1.0	1.0	3.1	1.3	1.3	1.4	1.1	N/A	4.2	1.8	1.4	1.7
Upper half of the distribution															
p75/p50	1.1	1.0	1.0	1.0	1.0	1.1	1.1	1.0	1.0	1.1	5.9	2.2	1.7	1.4	1.0
p90/p50	1.1	1.1	1.0	1.0	1.0	1.4	1.5	1.0	1.1	1.2	10.6	2.7	2.1	1.6	1.5
Interquantile range															
p75/p25	1.1	1.1	1.0	1.0	1.0	3.6	1.5	1.3	1.4	1.3	N/A	9.0	3.1	1.9	1.7
Tails															
p90/p10	1.2	1.1	1.1	1.1	1.1	2.8	3.2	2.1	1.7	1.8	15.0	13.7	9.2	8.2	7.6



#### Figure 6: Concentration Curves for Education Expenditures

Source: Calculations based on data from VLSS 1992/93, VLSS 1997/98, VHLSS 2004, and VHLSS 2006

## 3. Landholding and public services

#### 3.1. Household landholding

Vietnam has experienced bold land reforms since *Doi moi*. As agriculture was decollectivized in the late 1980s, agricultural land was re-allocated to households by administrative means and some reforms were put forward to support the emergence of a land market. Most notably, the 1993 Land Law officially introduced land titles and permitted land transactions in the land

market. Although all land remained under state ownership; land use rights could now be legally transferred, exchanged, mortgaged, or inherited.

Such land reforms have led to important implications in land allocation in rural areas, where agricultural land is the most important household asset. Table 11a-11d record land endowment per household with respect to different types of land. Annual crop land has been the most important type of land to households but others have become increasingly important. Compared to the early 1990s, the average perennial land area per rural household increased by 70 percent, while forestry land area per household increased to up to 90 percent in 2006. The increasing importance of other types of land reflects a diversification in agricultural production in rural Vietnam. The plantation and export growth of coffee and other perennial crops are the driving forces behind this diversification process. For annual crop land, irrigation coverage was improved substantially over the fifteen years from 1993 to 2006, from 46 percent to 63 percent.

Calculations from Table 11a-11d reveal that land reforms, urbanization and rural industrialization translated into a decrease of nearly eight percent in annual crop land area between 1993 and 2006. Table 12 gives the average percentage of annual crop land area rented out by rural households in the same period. In contrast to the decrease in annual crop land area, the percentage of land area rented out steadily increased after 1998. This increase in the incidence of land renting out was most pronounced in the two Deltas and the Central Highlands. However, as changes in land renting out were modest, this does not imply important implications from a general view.

	Anr	nual crop	Denemial	E a una at una	Water	Others
	Irrigated	Non-irrigated	Perenniai	Forestry	surface	Others
Rural average	2,041	2,408	710	175	103	272
<u>by ethnicity</u>						
Kinh/Hoa	2,232	1,974	669	71	110	175
Non-Kinh/Hoa	943	4,892	956	803	59	858
<u>by region</u>						
Red River Delta	2,183	219	150	31	112	36
North East	1,452	2,939	318	536	155	758
North West	-	6,388	1,354	2,451	180	1,707
North Central Coast	1,536	1,701	246	102	44	142
South Central Coast	1,593	1,085	162	55	-	196
Central Highlands	126	5,331	2,710	-	11	279
South East	,643	4,161	2,039	49	9	229
Mekong River Delta	3,676	4,264	1,209	-	187	178

#### Table 11a. Average rural landholding, 1993 (m2)

	Anı	nual crop	Demonstal	<b>F</b> our of the	Water	Others
	Irrigated	Non-irrigated	Perenniai	Forestry	surface	Others
Rural average	2,773	1,109	1,197	1,006	1,026	1,770
<u>by ethnicity</u>						
Kinh/Hoa	2,831	919	1,149	423	1,206	1,270
Non-Kinh/Hoa	2,461	2,116	1,454	4,092	77	4,417
<u>by region</u>						
Red River Delta	2,106	134	239	15	4,217	199
North East	1,898	1,398	527	2,789	332	3,462
North West	835	6,265	1,083	4,213	251	3,137
North Central Coast	1,507	1,090	340	2,050	55	2,395
South Central Coast	1,651	1,023	472	78	0	1,801
Central Highlands	2,365	2,917	5,408	36	17	3,215
South East	2,790	1,736	4,350	497	14	2,323
Mekong River Delta	5,895	691	1,548	126	76	952

# Table 11b. Average rural landholding, 1998 (m2)

# Table 11c. Average rural landholding, 2004 (m2)

	Anı	nual crop	Denensial	Demosture	Water	Others
	Irrigated	Non-irrigated	Perenniai	Forestry	surface	Others
Rural average	2,920	1,071	1,035	1,072	306	527
<u>by ethnicity</u>						
Kinh/Hoa	2,884	584	941	497	337	481
Non-Kinh/Hoa	3,133	3,925	1,650	4,833	107	829
<u>by region</u>						
Red River Delta	1,946	70	79	100	95	167
North East	2,451	1,030	827	3,813	75	586
North West	2,223	7,633	689	5,367	46	658
North Central Coast	1,998	973	220	1,489	119	526
South Central Coast	2,080	1,617	1,094	785	73	297
Central Highlands	2,343	2,955	5,384	263	35	1,937
South East	2,536	2,304	3,486	620	41	1,224
Mekong River Delta	6,099	308	863	326	1,088	393

	Anr	nual crop	D	T a secolo s	<b>T</b> A7. 4	Others
	Irrigated	Non-irrigated	Perennial	Forestry	water surface	Others
Rural average	2,998	1,117	1,216	1,207	287	364
<u>by ethnicity</u>						
Kinh/Hoa	2,963	546	1,172	512	316	336
Non-Kinh/Hoa	3,182	4,159	1,475	5,361	115	531
by region						
Red River Delta	1,870	92	115	106	114	146
North East	2,356	1,057	840	4,944	214	434
North West	2,667	8,182	800	5,305	35	477
North Central Coast	2,377	985	207	1,231	38	389
South Central Coast	1,827	1,528	656	1,447	64	167
Central Highlands	2,336	3,500	6,845	1,097	42	955
South East	3,051	1,875	4,293	64	7	649
Mekong River Delta	6,145	279	985	208	989	348

## Table 11d. Average rural landholding, 2006 (m2)

# Table 12: Annual crop land area rented out as percentage of total annual crop land area (%)

	1993	1998	2004	2006	
Rural average	3.20	2.50	3.40	5.10	
<u>by ethnicity</u>					
Kinh/Hoa	3.10	2.70	4.20	6.40	
Non-Kinh/Hoa	3.60	1.60	1.10	1.80	
<u>by region</u>					
Red River Delta	0.50	2.70	4.70	6.10	
North East	1.30	1.00	1.50	2.30	
North West	0.60	0.60	0.50	0.50	
North Central Coast	1.30	1.80	1.80	2.10	
South Central Coast	0.30	2.00	1.60	4.20	
Central Highlands	0.00	0.00	1.80	2.10	
South East	4.00	4.20	7.00	8.90	
Mekong River Delta	6.50	3.10	4.70	8.30	

Investigation of statistics on household allocation of land reveals certain patterns in inequality with respect to geography and ethnicity. Land allocation also appears to be influenced by a regional pattern. As shown in Table 11a-11d, agricultural land was the most abundant in the Northwest, the Central Highlands, and the Mekong River Delta. Compared to the rural average, households in the Red River Delta and the (North and South) Central Coast were of considerably lower landholding. Regarding different types of lands, forestry land was the most abundant in the Northern Uplands areas (including the Northeast and the Northwest). Not surprisingly, households in the Northwest and the Central Highlands possess the largest areas of perennial lands in the country. The above analysis noted the rapid expansion in irrigation coverage during the period of 1993-2006. This expansion was, however, uneven across regions. As shown in Table 11a-11d, while most of the annual crops in the two Deltas were irrigated, only one fourth of the annual crops in the Northwest and 40 percent of those in the Central Highlands were irrigated in 2006.

Regarding ethnicity, it is a fact that ethnic minorities possessed more land than the Kinh/ Hoa people and that endowment advantage tended to increase over time. At the start of the land reform in 1993, an average ethnic minority-headed household possessed 63 percent more land (of all types) than an average Kinh/Hoa-headed household did. After fourteen years, this advantage ratio rose to 154 percent. This advantage ratio can be observed for all types of land, but is most pronounced for forestry landholding. On average, ethnic minority-headed households possessed forestry land areas ten times larger than those of majority-headed households.

Although ethnic minorities are entitled to more land than the Kinh/Hoa people, debates have focused on quality of land and patterns of land use. Information on quality of land was not available from the VHLSS series, but irrigation patterns could be used to partially inform this aspect. In recent years (i.e. 2004 and 2006), while more than 80 percent of annual crop land areas of the Kinh/Hoa people were irrigated, coverage for those of ethnic minorities were only 44 percent. In addition, as ethnic minorities reside mostly in mountainous areas, their annual crop land in general may be naturally assumed to be less fertile as compared to that of the Kinh/Hoa people, which is located in the two Deltas or in coastal crop land areas. At the same time, the agricultural extension services provided to ethnic minorities are often inefficient as they are based on wet rice cultivation techniques which are only suitable for the lowlands (Jamieson et al., 1998, World Bank, 2009). Rice varieties that are more appropriate for the soil conditions in the mountains are often too expensive (VASS, 2009).

Thus, endowed with better land quality, the Kinh/Hoa people were generally more successful in translating their land assets into higher returns under Vietnam's new market economy. The Kinh-Hoa group diversified to a larger extent within the agricultural sector. They now relied more on industrial and perennial crops and less on low-value staple crops and often supplemented their farm income with trading or services. The ethnic minorities, on the other hand, tended to be trapped in producing staple and traditional agricultural products (World Bank, 2009). To make a meaningful comparison in crop patterns between ethnic minority-headed households and Kinh/Hoa-headed households, this chapter uses a partial access to the Baseline Study (BLS) of Socio-Economic Development Programme for Ethnic and Mountainous Areas (hereafter referred to as Programme 135-II) conducted on 6,000 households located in 200 poor communes under the coverage of Programme 135-II. As shown in Pham Thai Hung *et al.* (2008, p.32), the land endowment advantage of ethnic minorities over the Kinh-Hoa group (as discussed above) can also be observed through this BLS in these communes.
[I]n general, the minority-headed households appeared to have substantially larger landholding than the Kinh/Hoa-headed counterparts. On average, the minority-headed households in the P135-II communes had an agricultural land area of 19,351 m<sup>2</sup>, meanwhile the Kinh/Hoa households had only 13,271 m<sup>2</sup>, meaning a difference of 6,080 m<sup>2</sup>. This is attributable to the differences in forestry land endowment across the two ethnic groups. While there were no considerable differences in the endowment of annual crop and perennial lands between the Kinh/Hoa and the minority in the P135-II communes, the ethnic minorities were more dependent on forestry as the most important type of household landholding. On average, the forestry landholding of the minority was four times larger than that of the Kinh/Hoa.

Table 13 illustrates the crop patterns in these communes in 2007. The overall pattern of agricultural land use is determined by the four main agricultural activities including paddy rice, other food crops, industrial crops, and fruits. Both Kinh/Hoa-headed and minority-headed households in P135-II communes allocated about 54 percent of their land endowment to paddy rice production. Apart from rice, the minority-headed households used most of the remaining agricultural land for other food crops, while the Kinh/Hoa-headed households allocated the remaining evenly to production of industrial crops and other food crops. As the minority-headed households concentrated mainly on rice and other food crops, these two types of crops contributed up to 40 percent of the total average income earned by the ethnic minority households in the P135-II communes. For the Kinh-Hoa households, income from paddy rice and food crops made up only 20 percent of their total income, much less significant than the 40 percent in the case of their minority counterparts.

	Paddy rice	Other food crops	Industrial crops	Fruits
Land allocation for crops (%)				
Ethnic minorities	53.87	37.49	7.52	1.12
Kinh/Hoa	55.43	19.15	19.67	5.75
% of crop income in total income				
Ethnic minorities	22.95	17.24	3.47	1.13
Kinh/Hoa	15.86	4.22	6.31	1.45

#### Table 13: Crop patterns across ethnic groups in the poorest communes

Source: Compiled from Table 4.11 to Table 4.14 in Pham Thai Hung et al. (2008)

The current debate on poverty and inequality in Vietnam revealed the problem of landlessness. Ravallion and van de Walle (2008) showed that landlessness rate increased by two thirds over the period of 1993-2004, from less than 8 percent to 12.3 percent (see Table 14). However, as suggested by aggregated statistics, landlessness does not necessarily imply a negative outcome. Table 14 shows that the poverty rate was consistently higher among households with land than among landless ones in all years. Ravallion and van de Walle (2008) investigated the consumption distribution of landless households between 1993 and 2004 but could not find evidence for subgroups (i.e. the poor and non-poor) among them. There was also a sharp reduction in the poverty rate among landless households, which occurred at roughly

the same rate as that among landed ones. It was also noted that increasing landlessness was most common among the Kinh/Hoa households. Most notably, the contraction of poverty was the most significant for ethnic minority-headed households during the period of 1993-2004 when the poverty rate decreased from nearly 97 percent to 46 percent. As a result, there was a considerable gap between the poverty rates of landed and landless ethnic minority-headed households. One possible explanation for the relative better-off position of landless households as compared to landed ones is that landless households probably gave up their land for "good" reasons such as to invest in moving out of agriculture to non-farm activities.

	Rural	Vietnam	Ethnic 1	minorities	Kir	1h/Hoa
Population with land	%	Poverty	%	Poverty	%	Poverty
1993	92.2	70.04	96.6	89.39	91.4	66.2
1998	93.1	45.9	95	76.04	92.7	39.13
2002	86.1	38.6	96	73.96	84.4	31.44
2004	87.7	25.99	96	63.36	86.1	18.06
Landless population						
1993	7.8	50.87	3.4	97.12	8.6	47.38
1998	6.9	40.51	5	80.14	7.3	34.66
2002	13.9	25.11	4	62.16	15.6	23.4
2004	12.3	18.14	4	46.41	13.9	16.6

#### Table 14: Poverty and landholding status in rural Vietnam

Source: Compiled from Table 3.3 in Ravallion and van de Walle (2008, p. 54)

#### 3.2. Access to Healthcare Services

This subsection focuses on the evolution of access to healthcare services; specifically access to healthcare facilities, access to the health insurance scheme and other healthcare subsidies using information available from VLSSs and VHLSSs. It should be noted that VLSS 1992/93 did not collect any information on the above-mentioned aspects of healthcare services, therefore is not included in the analysis of this subsection.

Nationwide access to healthcare facilities increased by more than 5 times between 1998 and 2006, from only 5 percent in 1998 to 37 percent in 2006. Although the rate of access to healthcare facilities in urban areas was higher than that in rural areas, the access gap was negligible. By socio-economic region, it could be seen from Table 15 that the North East, the North West and the North Central Coast consistently had less access to healthcare facilities than other regions did. This implies that either people in the North East, the North West, and the North Central Coast were healthier than people in the rest of the country, or there was inequality in access to healthcare facilities between these regions. Of these two explanations, the latter would be more likely.

	1998	2002	2004	2006	
Total average	5.02	16.88	34.78	36.89	
By urban - rural					
Rural	4.82	16.55	33.76	36.47	
Urban	5.72	17.96	37.73	38.04	
By socio-economic region					
Red River Delta	5.27	15.76	33.22	33.98	
North East	4.55	12.34	25.74	29.53	
North West	4.4	13.75	27.92	29.51	
North Central Coast	4.92	14.41	26.46	29.59	
South Central Coast	5.18	17.03	36.32	37.59	
Central Highlands	4.06	21.68	40.1	42.73	
South East	5.22	19.81	39.96	41.1	
Mekong River Delta	5.18	19.15	41.44	44.76	
By ethnicity					
Kinh/Hoa	5.11	17.35	35.65	37.71	
Ethnic minorities	4.47	13.61	28.8	31.63	
By gender of HH head					
Male	4.72	16.14	33.65	35.68	
Female	6.1	19.74	38.89	41.11	
By education of HH head					
No education	5.69	N/A	38.5	38.89	
Lower than primary education	7.58	18.17	37.6	38.03	
Primary education	5.2	16.78	34.36	37.09	
Lower secondary education	4.13	15.4	31.33	34.1	
Upper secondary education	4.08	15.98	31.59	35.29	
Vocational training	5.87	17.22	34.92	38.29	
College, university and above	4.82	19.12	37.76	40.26	
By occupation of HH head					
Agriculture	4.75	19.87	33.1	35.7	
Industry	4.26	15.8	32.86	36.19	
Services	5.44	16.72	34.98	37.02	
Not working	6.66	16.84	41.65	41.62	

### Table 15: Access to healthcare facilities by region and household characteristics (%)

Source: Calculations based on data from VLSS 1997/98, VHLSS 2004, and VHLSS 2006

By ethnicity, Kinh/Hoa households had better access to healthcare services than ethnic minority households did. The access gap between them widened from 1998 to 2004, but narrowed slightly in the period of 2004–2006. It is interesting to observe from Table 15 that members of households headed by females were more likely to visit health centers than members of household headed by males. The education level of the head of household, on the other hand, did not seem to have any impact on the level of access to healthcare facilities as households with heads having no education or lower than primary education had more or less equal access as compared to households with heads having up to vocational training or college, university and above education. This implies that there was no inequality in access to healthcare facilities by occupation of the head of household - be it working in the agricultural, industry or service sector, especially in 2004 and 2006 - except for members of households with non-working heads. These individuals visited healthcare centers more frequently than individuals in households with working head. This could be due to the fact that the non-working were more likely to get sick than the working ones.

Table 16 records access to healthcare facilities by consumption expenditure. By expenditure distribution quintile, access to healthcare facilities increased significantly from 1998 to 2006 across all groups except for the richest group in 2006. While the access rate in 2006 of quintiles 1-4 increased, the access rate of quintile 5 almost remained intact. As a result, the access gap between the richest group and all the other groups was narrowed down, albeit staying significant. The access rates corresponding to selected percentiles of expenditure distribution also show that richer groups had better access to healthcare facilities than poorer groups. This may imply that the poor could be facing inequality in access to healthcare facilities.

	1998	2002	2004	2006		
By consumption expenditure distribution						
Quintile 1	3.37	12.74	29.6	32.05		
Quintile 2	4.32	14.83	32.49	35.12		
Quintile 3	5.04	16.28	34.89	37.38		
Quintile 4	6.04	18.85	36.17	38.8		
Quintile 5	6.31	21.7	40.77	40.95		
By selected percentile of expendit	ure distribu	tion				
p10	3.35	13.68	26.84	32.44		
p25	4.04	13.3	30.88	34.16		
p50	4.65	15.6	33.16	36.54		
p75	6.59	18.83	34.96	38.8		
p90	6.67	21.14	40.97	39.74		

#### Table 16: Access to healthcare facilities by consumption expenditure (%)

	1998	2002	2004	2006
Lower half of the distribution				
p25/p10	1.21	0.97	1.15	1.05
p50/25	1.15	1.17	1.07	1.07
Upper half of the distribution				
p75/p50	1.42	1.21	1.05	1.06
p90/p50	1.43	1.36	1.24	1.09
Interquantile range				
p75/p25	1.63	1.42	1.13	1.14
Tails				
p90/p10	1.99	1.55	1.53	1.23

Source: Calculations based on data from VLSS 1997/98, VHLSS 2004, and VHLSS 2006

With regard to access to the health insurance scheme, the information is not available in VHLSS 2002. Therefore, Table 17 provides the statistics for only three years; namely 1998, 2004 and 2006. It can be seen from this table that nationwide access to the health insurance scheme improved significantly during the 1998–2006 period, nearly tripling from 15.7 percent in 1998 to 40.6 percent in 2006. While access to health insurance in rural areas tripled from 12.1 percent in 1998 to 36.9 percent in 2006, access in urban areas only almost doubled from 28.4 percent in 1998 to 50.9 percent in 2006. As a result, the access gap between rural and urban areas was narrowed down, although it still remained large. By socio-economic region, there was a big gap in access to the health insurance scheme between the North West, the Central Highlands and the Mekong River Delta versus the rest of the country in 1998. The situation had improved for the North West by 2004; however, access to the health insurance scheme dropped significantly in the North West in 2006 while it increased sharply in the Central Highlands. As a consequence, a big gap in access to the health insurance scheme still existed in 2006 between the North West, the Mekong River Delta and the other 6 regions (Red River Delta, North East, North Central Coast, South Central Coast, Central Highlands, and South East). In other words, inequality existed between these regions in access to the health insurance scheme.

# Table 17: Access to the health insurance scheme by regionand household characteristics

	1998	2004	2006
Total average	15.73	29.36	40.61
By urban - rural			
Rural	12.07	25.45	36.86

	1998	2004	2006
Urban	28.39	40.61	50.91
By socio-economic region			
Red River Delta	21.94	33.44	43.18
North East	14.48	28.85	44.07
North West	7.02	35.57	26.58
North Central Coast	19.63	31.64	41.24
South Central Coast	15	34.68	47.34
Central Highlands	3.84	20.27	46.12
South East	17.54	32	42.45
Mekong River Delta	10.05	21.37	31.77
By ethnicity			
Kinh/Hoa	16.97	30.29	41.74
Ethnic minorities	8.18	22.97	33.45
By gender of HH head			
Male	14.52	28.02	39.31
Female	20.13	34.21	45.23
By education of HH head			
No education	8.61	21.84	32.01
Lower than primary education	33.35	15.8	27.89
Primary education	10.21	24.1	34.52
Lower secondary education	16.91	28.1	41.03
Upper secondary education	22.09	36.65	44.84
Vocational training	31.48	46.79	59.13
College, university and above	51.17	67.3	77.99
By occupation of HH head			
Agriculture	12	23.78	35.46
Industry	18.38	31.52	42.06
Services	25.55	39.56	49.33
Not working	17.99	30.16	42.25

Source: Calculations based on data from VLSS 1997/98, VHLSS 2004, and VHLSS 2006

By household characteristics, Kinh/Hoa people had better access to the health insurance scheme than ethnic minority people. Members of female-headed households also had better access to health insurance than members of male-headed households. The education level of the head of household seemed to have some impact on the level of access to the health insurance scheme as members of households with better-educated heads (defined as those having had vocational training, college education, university education or above) had better access than those of households with worse-educated heads (defined as those having had no education, lower than primary education or up to primary education). In other words, there was inequality between individuals of different education levels in access to the health insurance scheme. One explanation could be that members of households with better-educated heads were more aware or more informed of the health insurance scheme than those with worse-educated heads. In terms of the occupation of the head of household, different sectors displayed large differences in access to health insurance. People in the service sector had the highest access, followed by those in the industrial and agricultural sectors, with rates of 49.3 percent, 42.1 percent and 35.5 percent respectively in 2006.

By consumption expenditure, there was a large gap between the poorer and the richer groups in access to the health insurance scheme (Table 18). Although access to the health insurance scheme had significantly improved for quintile 1, quintile 2, p10 and p25 during the 1998–2006 period, the absolute inequality between these groups and quintile 4, quintile 5, p75, p95 remained large. However, it is noteworthy that the relative gap was narrowed down significantly. For example, both interquantile ratio (p75/p25) and tail ratio (p90/p10) reduced from 3.23 and 5.14 in 1998 to 1.52 and 1.94 in 2004 and further to 1.29 and 1.58 in 2006, respectively.

	1998	2004	2006			
By consumption expenditure distribution						
Quintile 1	6.22	22.66	34.33			
Quintile 2	9.63	22.7	34.28			
Quintile 3	13.63	25.31	36.16			
Quintile 4	20.12	32.8	43.08			
Quintile 5	29.01	43.35	55.22			
By selected percentile of expenditure di	stribution					
p10	4.74	20.75	32.99			
p25	6.22	21.48	34.13			
p50	11.08	22.09	36.28			
p75	20.09	32.74	43.99			
р90	24.37	40.18	52			

#### Table 18: Access to the health insurance scheme by consumption expenditure

	1998	2004	2006
Lower half of the distribution			
p25/p10	1.31	1.04	1.03
p50/25	1.78	1.03	1.06
Upper half of the distribution			
p75/p50	1.81	1.48	1.21
p90/p50	2.2	1.82	1.43
Interquantile range			
p75/p25	3.23	1.52	1.29
Tails			
p90/p10	5.14	1.94	1.58

Source: Calculations based on data from VLSS 1997/98, VHLSS 2004, and VHLSS 2006

VLSS 1998 and VHLSS 2002 did not collect information related to access to other healthcare subsidies. Therefore, Table 19 and Table 20 only provide information regarding access to other healthcare subsidies for the two years 2004 and 2006.

Table 19: Access to	o other healthcare	subsidies by region	and household	characteristics
		outoitales by region		

	2004	2006
Total average	8.15	12.63
By urban - rural		
Rural	9.66	14.93
Urban	3.81	6.32
By region		
Red River Delta	3.53	6.37
North East	13.37	22.41
North West	31.2	55.13
North Central Coast	9.71	17.42
South Central Coast	5.81	10.89
Central Highlands	25.77	19.56
South East	3.79	4.79

	2004	2006
Mekong River Delta	5.41	8.78
By ethnicity		
Kinh/Hoa	4.72	7.67
Ethnic minorities	31.91	44.36
By gender of HH head		
Male	8.87	13.62
Female	5.57	9.14
By education of HH head		
No education	12.02	19.53
Lower than primary education	8.08	10.26
Primary education	7.83	13.58
Lower secondary education	7.17	9.74
Upper secondary education	3.92	7.28
Vocational training	6.2	7.33
College, university and above	3.01	6.05
By occupation of HH head		
Agriculture	11.98	17.58
Industry	4.12	7.92
Services	4.29	7.19
Not working	5.6	10.09

Source: Calculations based on data from VHLSS 2004, and VHLSS 2006

The government had been implementing healthcare subsidy programs (eg. via providing free health cards for the poor and the ethnic minority people, etc.) for years. Therefore, the trend observed in Table 19 and Table, although conflicting with the trends shown in Table 15 to Table 18, was understandable. Access to healthcare subsidies was much higher in rural areas than in urban areas, as well as in poorer regions or ethnic minority regions such as the North East, the North West and the Central Highlands than in the other parts of the country. Ethnic minorities, groups with lower education levels and people working in the agricultural sector also received more healthcare subsidies than all other groups. Similarly, richer groups had less access to other healthcare subsidies than poorer groups. For example, while access to other healthcare subsidies of quintile 1 was 20.8 percent and 32.5 percent in 2004 and 2006 respectively, that of quintile 5 was only 2.8 percent and 4.2 percent respectively. There was evidence of inequality in access to other healthcare subsides across different groups; however,

this is not necessarily a bad thing. It simply implies that subsidy programs implemented by the government were targeted at the "right" groups to correct inequality in access to other types of healthcare services.

	2004	2006	
By consumption expenditure distribution			
Quintile 1	20.81	32.5	
Quintile 2	7.92	12.61	
Quintile 3	5.53	7.72	
Quintile 4	3.74	6.18	
Quintile 5	2.76	4.15	
By selected percentile of expenditure distributio	on		
p10	20.67	35.44	
p25	13.27	18.41	
p50	6.81	7.51	
p75	4.75	7.92	
р90	2.42	5.17	
Lower half of the distribution			
p25/p10	0.64	0.52	
p50/25	0.51	0.41	
Upper half of the distribution			
p75/p50	0.7	1.05	
p90/p50	0.36	0.69	
Interquantile range			
p75/p25	0.36	0.43	
Tails			
p90/p10	0.12	0.15	

#### Table 20: Access to other healthcare subsidies by consumption expenditure

Source: Calculations based on data from VHLSS 2004, and VHLSS 2006

Similar to section 3, concentration curves for healthcare expenditure (against total household consumption expenditure) for all survey years are portrayed in Figure 7. From the Figure, it can be seen that all five concentration curves follow a similar pattern. Inequality in healthcare

expenditure seemed minor as the areas between the 45 degree lines and the concentration curves are not large. Compared to inequality in education expenditure, inequality in healthcare expenditure was less significant as the areas between the 45 degree lines and the healthcare expenditure concentration curves are much smaller in size than the corresponding areas for education expenditure. Another aspect dissimilar to the case of education expenditure is that inequality in healthcare expenditure remained almost the same over the 1993–2006 period as the curves were almost identical. There was no increase in the concentration of expenditure among the rich, implying no increase in the "inequality of opportunity" between the privileged and the less privileged.



#### Figure 7: Concentration curves of healthcare expenditure, 1993-2006

Source: Calculations based on data from VLSS 1993, VLSS 1998, VHLSS 2002, VHLSS 2004 and VHLSS2006

To sum up, the analysis suggests that inequality in access to healthcare facilities was not too large across different groups. Inequality in access to the health insurance scheme existed but seemed to have been compensated for by government programs providing healthcare or health insurance subsidies to the less privileged or the ethnic minorities. The patterns shown in the concentration curves of healthcare expenditure over the years do not suggest any increase in "inequality of opportunity" between the privileged and the less privileged.

#### 3.3. Access to key public services

This subsection focuses on access to key public services, including selected infrastructural facilities, education, and healthcare services at the village and commune levels. Whenever possible, inequality in access to those services will be highlighted. This subsection was built on the information available from the commune questionnaires of VLSSs and VHLSSs. It is unfortunate that these commune-level surveys did not cover urban areas, which means that the information explored in this subsection is limited to rural access to key public services.

For the analysis on access to key infrastructure, village-level information was drawn on in order to facilitate a better assessment as compared to one based on commune-level information. However, some information on key infrastructures (such as car roads or public transport) were not given at this level in the first VLSS of 1992/93, thus only data from 1998 to 2006 were used. Table 21 records village-level access to car roads, public transport, postal services, and daily markets. Most rural villages (87 percent on average) had car roads during the period of 1998-2006. For those villages without direct access to car roads, a convenient distance of less than five kilometers to the nearest car road was recorded in every case. Most notable was the sharp increase in access to postal services. While less than one third of rural villages were able to get to a post office easily in 1998, nearly 86 percent could do so in 2006. There was also an impressive improvement in the incidence of daily markets at villages with the percentage of rural villages having daily markets rising from 54 percent in 1998 to 64 percent in 2006.

These aggregate data at the regional level reveal little in terms of inequality. Villagelevel access to both postal services and daily markets in 1998 was less even than that in 2006. This regional unevenness in access to these facilities, however, attenuated over time thanks to investments in basic infrastructure. However, some differences between regions in access to infrastructure remained in 2006. For instance, villages in the Northwest were the least commercialized in terms of having daily markets (only one fourth of Northwestern villages had access to daily markets as compared to the rural average of nearly 55 percent). Only half of the villages in the Central Highlands and the Northeast had access to daily markets. Regarding postal services, improvement in coverage was most pronounced in the Northwest, the Northeast, the North Central Coast, and the Central Highlands, which are incidentally also the poorest regions in the country.

	Car roads in the village (%)	Distance to nearest car road (km)	Public transport in the village (%)	Distance to nearest public transport (km)	Post offices in the village (%)	Daily markets in the village (%)
1998						
Rural average	87.2	4.9	57.7	6	30.3	54.6
<u>by region</u>						
Red River Delta	92.9	3.7	46.4	4	28.6	64.3
North East	95.2	4.5	28.6	9.9	23.8	47.6
North West	100		75	3.5	0	0
North Central Coast	89.5	5.8	57.9	4.8	10.5	21.1
South Central Coast	100	2	52.9	2.5	18.8	68.8
Central Highlands	88.9	13.8	44.4	17.9	33.3	66.7
South East	100	2.8	60	5.6	32	52
Mekong River Delta	57.6	4.9	87.9	2.7	54.6	66.7
2004						
Rural average	87.1	4.6	49	5	82.7	62.2
<u>by region</u>						
Red River Delta	96	1.2	41.1	2.9	90.6	68.1
North East	89	3.1	34.7	5.7	83.4	52.5
North West	76.9	4.2	34.7	10.7	77.7	29.8
North Central Coast	96.3	2	35.7	6.1	85.9	62.5
South Central Coast	96.4	1.5	47.5	6.2	84.2	73.5
Central Highlands	92.7	3.9	40.9	6.8	75.9	38
South East	99.5	0.2	56.6	3.6	70.3	70.8
Mekong River Delta	62.8	5.6	77.7	2.5	80	69.3
2006						
Rural average	87.1	4.9	48	5.2	86.8	63.6
<u>by region</u>						
Red River Delta	95.3	1.8	42.4	2.8	90.5	70
North East	85.9	3.3	34	5.7	88.9	55.4
North West	81.4	4.3	34.8	12.4	89	25.4
North Central Coast	96.8	2.6	33.1	4.4	88.4	65.5
South Central Coast	96.9	1.3	46.7	5.8	85.6	72.8
Central Highlands	96.4	3.3	41.6	10.2	86.1	50.4
South East	98	2.6	57.6	5.6	77.3	73.9
Mekong River Delta	64.4	6.3	73.7	3	84.5	66.4

#### Table 21: Access to key infrastructures at the village level

Source: Calculations based on data from VLSS 1997/98, VHLSS 2004, and VHLSS 2006

Notes: Information on most of the village-level variables in this table was not available in VLSS 1992/93.

Regarding access to healthcare and education, information on the village level was not available from VLSSs and VHLSSs and thus, analysis was solely based on the commune-level access recorded in Table 22. Most notably, there was a sharp improvement in commune-level access to primary and lower secondary education in the period of 1998-2006; and most of these changes occurred between 1998 and 2004. At the beginning of the period in 1998, 72 percent of commune-level access to education is even more prominent for the case of lower secondary schools. While only one third of rural communes had lower secondary schools in 1998, more than 94 percent of rural communes did in 2004 and 2006. Access to upper secondary schools, however, was still limited. Up to 2006, only 16 percent of rural communes had upper secondary schools.

	Commune health center	Dist/prov health center	Primary schools	Lower secondary schools	Upper secondary schools
1998					
Rural average	98.7	7.7	71.8	32.9	8.3
<u>by region</u>					
Red River Delta	100	3.6	75	53.6	10
North East	100	15	38.1	30	16.7
North West	100	0	75	50	0
North Central Coast	94.7	0	31.6	16.7	0
South Central Coast	100	11.8	82.4	26.7	0
Central Highlands	100	11.1	100	28.6	0
South East	100	4	92	37.5	5
Mekong River Delta	97	12.1	84.9	24.2	16
2004					
Rural average	99.3	3	99.8	94.1	14
<u>by region</u>					
Red River Delta	100	3.2	100	99.6	12.4
North East	100	1.8	99.4	96	12.6
North West	98.4	9.1	100	93.4	12.4
North Central Coast	99.6	1.5	100	91.8	14.1
South Central Coast	99.5	3.1	100	93.9	17.4
Central Highlands	98.5	3.7	98.5	93.4	14.6
South East	99.5	3.3	100	91	14.6
Mekong River Delta	98.3	2.3	100	90.1	15.3
2006					
Rural average	98.4	2.9	99.9	94.8	16

#### Table 22: Access to healthcare and education services at the commune level

	Commune health center	Dist/prov health center	Primary schools	Lower secondary schools	Upper secondary schools
<u>by region</u>					
Red River Delta	99.8	3.2	100	99.4	14.6
North East	99.7	2.4	100	98	14.4
North West	100	5.9	99.2	99.2	11
North Central Coast	100	3.2	100	93.3	15.1
South Central Coast	98.5	4.6	100	92.8	16.9
Central Highlands	95.6	2.2	99.3	95.6	19
South East	98	3.9	100	90.2	21.7
Mekong River Delta	95.5	1.2	100	90.2	16.7

Source: Calculations based on data from VLSS 1997/98, VHLSS 2004, and VHLSS 2006 Notes: Data on commune-level access to these facilities in VLSS 1992/93 were only available for 120 communes. Hence, statistics obtained from this small commune sample might be not as reliable as those obtained in later years. Considering this, we have left out VLSS 1992/93 in constructing this table.

The aggregate data at the regional level obtained from VLSSs and VHLSSs do not exhibit significant differences in access to key public services between regions. The P135-II BLS, however, reveals a considerable access gap between the poorest communes (i.e. P135-II communes) and the rural average level. As the P135-II BLS was implemented in 2007, the VHLSS 2006 data should be taken as the benchmark for comparison. Table 23a shows that access to any type of school in the P135-II communes was considerably lower than the corresponding rural average level. For instance, only 78 percent of the P135-II communes had primary schools while the rural average level was almost 100 percent. This disadvantage appeared more evident in Central Vietnam than in all other regions.

	Having primary schools	Having lower secondary schools	Having higher secondary schools
Geography of communes			
Coastal or delta	100	93.33	0
Others (mid-land, mountainous)	76.89	65.34	2.39
Region			
North	75.46	66.87	3.07
Centre	76.92	60.26	1.28
South	100	88	0
Average P135-II commune	78.2	66.92	2.26

#### Table 23a: Access to education in P135-II communes

Source: Compiled from Table 5.7 in Pham Thai Hung et al. (2008)

Notes: The sampling process in P135-II BLS does not support the categorization by eight geographical regions as in VHLSSs.

	Poor provision of facilities and tools	Too-low living standards for teachers or Limited school budget	Not enough space, tables or chairs	Low quality teachers	Others or Do not know
Geography of communes					
Coastal or delta	73.33	6.67	0	6.67	33.33
Others (midland, mountainous)	86.06	43.82	19.92	13.15	27.89
Regions					
North	85.89	52.76	23.31	12.27	29.45
Centre	88.46	28.21	15.38	16.67	17.95
South	72	12	0	4	52
Average P135-II commune	85.34	41.73	18.8	12.78	28.2

# Table 23b. Reasons for individuals' non-attendance to primary schoolsin the P135-II communes

Source: Compiled from Table 5.8 in Pham Thai Hung et al. (2008)

Notes: There were other unlisted reasons for children's non-attendance to primary schools, thus the sum does not necessarily equal to 100 percent.

Table 23b sheds light on another disadvantage for the poorest communes in accessing education services. It is clear that the most common reason for ethnic minority children not to attend primary schools in the P135-II communes was due to the schools' poor provision of facilities and tools. This reaffirms the finding by Swinkels and Turk (2006) which assessed the learning outcomes in 3660 schools across the country and concluded that a combination of low quality teaching, poor facilities, long travelling times and language barriers caused gradefive children in ethnic minority areas to be learning less than their counterparts in other parts of the country. Therefore, Swinkels and Turk (2006) suggested that ethnic minority students should start school earlier and repeat grades less often and that schools in isolated areas should be better resourced to overcome these disadvantages of their student intakes. In addition, language barriers emerged among the foremost constraints to ethnic children in going to and continuing with school by qualitative analysis (World Bank, 2009). The problems ranged from the shortage of preschool teachers to the poor implementation of the bilingual model at ethnic schools. After ethnic children were enrolled, they did not receive sufficient support in terms of language. The main reason for this poor implementation of the bilingual model was the shortage of capable teachers and the limited availability of textbooks for ethnic languages. Ethnic minority teachers make up only eight percent of all teachers nationwide (World Bank 2009). In this regard, the disadvantages for the poorest communes and for ethnic minorities in education were twofold: not only was their access limited, but they also only had access to low quality facilities.

#### 4. Does Vietnam face the risk of falling into inequality traps?

Different "opportunities" in life for different individuals should only be attributed to differences in efforts, talents, and luck rather than to any other external factors beyond their control. However, in Vietnam, an individual's prospects (educational opportunities, landholding, access to healthcare, access to public services) seem to be influenced by these external factors (race, birthplace, parental background, family income, etc) and thus the different dimensions of inequality such as healthcare, education, income, etc, could interact with and reinforce one another over time.

To analyze this phenomenon, the so-called "inequality trap", apart from employing statistics illustrating the gaps in opportunity across different groups of people with different conditions, we also estimated the group inequality (GI) and computed the correlations of this index over time. This index is one of the most popular measures of group inequality that many applied researches have utilized (see Kishor, 1993 and Chakraborty, 2001). According to this measure, if there are two identifiable groups of people, A and B with  $X_A$  and  $X_B$  respectively being the average levels of a certain indicator for the two groups; then the group inequality index (GI) will take the simple form:  $GI = X_A/X_B$ . Based on the GI correlations, we could obtain a snapshot of the inequality trap and from there, would be able to assess whether the above-mentioned external conditions could indeed influence people's "opportunities" in life.

*Regarding birthplace*, we found that the GI correlations between rural and urban areas with respect to access to lower secondary and upper secondary schools were 0.88 and 0.77 respectively, implying that educational opportunities were likely to be unequal. Similarly, the GI correlation between the Red River Delta and the North West was estimated at 0.97 for access to upper secondary schools, confirming that birthplace was one of the factors affecting people's educational opportunities.

*Regarding gender*, the GI correlation between males and females with respect to access to lower secondary school was estimated at 0.94, implying that boys and girls had different educational opportunities just because they are of different genders.

*Regarding income*, the GI correlations between the poorest 20 percent of households and the richest 20 percent of households for access to lower secondary and upper secondary schools were 0.91 and 0.95 respectively, implying that income inequality may interact with and reinforce inequality in education. Figure 8 further supports this conclusion by illustrating the net enrolment rates to lower and upper secondary schools by the first and the fifth income quintiles over time, both of which did not display any signs of increased access to schools.



#### Figure 8: Education by income quintile

Source: Calculations based on data from VLSS 1992/1993, VLSS 1997/98, VHLSS 2004, and VHLSS 2006

Household income influences not only educational opportunities but also access to healthcare facilities. Figure 9 describes access to healthcare facilities by the lowest income quintile and the highest income quintile, thereby showing that the opportunity gap between these two quintiles tended to widen over time (except for a slight shrink in 2006).



Figure 9. Access to healthcare facilities by income quintile

Source: Calculations based on data from VLSS 1997/98, VHLSS 2004, and VHLSS 2006

*Regarding ethnicity*, people from different ethnic groups seemed to have unequal opportunities in access to education and healthcare facilities. As shown in Figure 10, the Kinh/ Hoa group always had greater access to healthcare services. The opportunity gaps between the Kinh/Hoa group and ethnic minority group tended to widen over time. Meanwhile, as shown in Figure 11, the gaps between them in access to education (typically upper secondary schools) were even larger.





Source: Calculations based on data from VLSS 1997/98, VHLSS 2004, and VHLSS 2006



Figure 11. Access to education by ethnicity

Source: Calculations based on data from VLSS 1992/1993, VLSS 1997/98, VHLSS 2004, and VHLSS 2006

#### 5. Knowledge gaps and suggestions for future research

The analysis undertaken to generate the primary findings presented in this report will no doubt suggest a number of deeper questions to which answers are needed. Given the short time horizon envisaged for this paper, it will not be possible to satisfactorily address all of those potential questions here. Nevertheless, rather than ignoring them, it is useful to list the key unanswered questions in need of attention in this section, in the hope that future analysis may be able to resolve them.

#### 5.1 Inequality between "pockets of poverty" and the rest of the population

There is no doubt that Vietnam has been extraordinarily successful in harnessing the power of market incentives to engender rapid economic growth and due poverty reduction progress. As a result, around 30 million people were pulled out of poverty between 1993 and 2006. However, the poor is now concentrated in the so-called "pockets of poverty" – *tui ngheo*. Therefore, the resultant inequality in consumption expenditures, physical assets, and access to services between the poor living in these "pockets of poverty" and the rest of the population is likely to be most pronounced.

The "pockets of poverty" have not been well researched into. It is generally believed that the majority of these "pockets of poverty" are in rural and/or remote areas, especially areas with high concentrations of ethnic minorities such as the Northern Uplands or the Central Highlands. Baulch *et al.* (2009) showed that the poverty rate was extremely high among ethnic groups in the Northern Uplands and the Central Highlands at around 73 percent as compared to the rural average poverty rate of 20.4 percent in 2006. Although data in VHLSS were insufficient to estimate the accurate rates for individual ethnic groups, Pham (2009) came up with some rough figures which suggested that poverty was extremely worrying amongst certain ethnic groups, who experienced poverty rates of more than 60 percent as compared to the national average of only 16 percent in 2006.

What matters about these "pockets of poverty" is that it will be considerably more difficult for Vietnam to achieve the same rate of poverty reduction as it has done over the past two decades. The remoteness of these areas is likely to make hunger eradication and poverty reduction efforts directed at them much more expensive. Consequently, inequality between the poor in these "pockets" and the "average poor" is likely to become increasingly persistent.

In this context, there are two aspects of inequality that warrant future research, both of which applies to poorest areas.

First, inequality between the poor in the "pockets of poverty" and the rest of the population including the "average poor" needs to be better studied. It is reasonable to argue that the former's consumption expenditures, access to public services as well as infrastructural conditions are considerably lower than the latter's. However, no one has ever documented exactly how big the actual gaps are and how these gaps evolved over time.

Second, Pham (2009) suggested there could be considerable "intra-area" inequality in the poorest communes of the country. Investigation of the poverty profiles of the P135-II communes suggests that there were certain ethnic groups that had performed better than the rest in income-generating activities. Particularly, the Kinh/Hoa-headed households were better-off than the ethnic minority-headed households even in the poorest areas (see Pham, 2009; Pham *et al.* 2008). Therefore, it is vital to acquire a thorough understanding of this "intrapoorest areas" inequality in order to better inform policy discussions on tackling different types of inequality.

#### 5.2 Ethnic dimensions of inequality

The earlier analysis at times highlighted several ethnic dimensions of inequality. Indeed, ethnic minorities seemed to have experienced lower rates of poverty reduction than the general population did. In 2006, 52 percent of ethnic minorities lived under the poverty line; whereas the corresponding figure for the Kinh/Hoa group was just 10 percent. What is worrying is that the proportion of ethnic minorities in the poor population was monotonically increasing over time. In the early 1990s, only about 18 percent of the poor was ethnic minorities; however, this proportion rose to 29 percent, 39 percent, and 47 percent in 1998, 2004 and most recently, 2006 respectively (see Figure 12). In other words, despite accounting for less than 15 percent of the population, ethnic minorities still made up nearly half of the poor population. Still, it is likely that poverty will increasingly become a particularly ethnic minority phenomenon in the future.



Figure 12: Poverty among ethnic minorities

The Government of Vietnam and international donors have demonstrated strong commitments to further policy interventions to support the development of ethnic minorities (see Baulch *et al.* 2009 for a review). However, despite the continuous support from the Government and donors over the past two decades, the gaps in per capita household expenditure between Kinh-Hoa households and ethnic minority ones still widen over time from 47 percent in 1993 to 74 percent in 2006 (calculated using data from VLSS 1992/93 and VHLSS 2006). It is also important to note that this trend generally remained independent of the movement along the conditional distribution of household expenditures. In the P135-II communes, the income gap between the Kinh/Hoa-headed households and the rest was 49 percent in 2007. This suggests that there was a considerable gap in expenditure and/or income regardless of the location of ethnic minorities.

There are a number of studies that have tried to provide an explanation for the observation that ethnic minorities tend to be left behind and do not seem to have benefited as much from recent economic growth as the rest of the population did (see Van de Walle and Gunewardena, 2001; Baulch *et al.*, 2009, or World Bank, 2009). Pham (2009) reviewed current literature and concluded that most of the studies highlighted two components underlying the welfare gap between ethnic minority groups and the majority of the population. The first one concerned differences in "characteristics" or "endowment" of the two groups (e.g. household characteristics, education, land assets, access to infrastructures and public services); the second one concerned differences in "returns" to these "characteristics" or "endowment". It is generally believed that "differences in characteristics" accounted for less than half of the total gap, as the remaining had to be attributed to "differences in returns to endowment". This econometric evidence was consistent and well-established across different studies. While "differences in characteristics" have been well-studied, little is known about "differences in returns" still.

Source: Pham (2009)

Technically, "differences in returns" could be partly attributed to unobserved factors that were not taken into account (due to data availability constraints) in current literature. Key unobserved factors such as quality of education, quality of access to infrastructures and public services inter alia could exert considerable influences on "differences in returns". Also, World Bank (2009) documented evidence of misperceptions and stereotypes. It is quite common for some Kinh/Hoa people to hold "negative stereotypes" against ethnic minority people; and these stereotypes may serve to disempower or deprive the ethnic minorities of their economic and other rights. Our own observations (based on field experience in ethnic minority developing areas) suggest that ethnic minority people are frequently considered "less developed", and at times "more backward" than the Kinh/Hoa people. Ethnic minority people are also regarded as incapable of doing many economic transactions common among the Kinh/Hoa people such as charging interests on loans or selling things to neighbours and their own kin. These misperceptions and stereotypes may have adverse effects on ethnic minorities.

In this context, a better understanding of the real reasons underlying the poverty and inequality that ethnic minorities have been facing is certainly needed. The existing database on ethnic minorities is still rather patchy. Some datasets, such as VHLSSs, allow for disaggregation of ethnic minorities into small groups or even individual ethnic groups; however, observations for each individual group were insufficient to provide any reliable estimates. As a result, the current understanding on ethnic minorities is largely based on a majority-minority dichotomy. Poor classification and understanding of ethnic minorities may lead to inefficient distribution of resources, and more comprehensive local data would help to identify the most vulnerable ethnic minority groups.

#### 5.3 Inequality among the urban poor

The Vietnam Development Report 2008 found the urban poverty rate to be much lower than the rural one. However, there is evidence of a slowdown in the urban poverty reduction rate; in fact, urban poverty even slightly increased from 3.6 percent in 2004 to 3.9 percent in 2006 (World Bank, 2008). Moreover, Oxfam (2009) argued that the calculated urban poverty rate was only so low because the 2008 poverty standard was used. This standard, as the argument went, became out of date in the context of high inflation in the next two years 2009 and 2010. If the poverty threshold was raised by 50 percent and applied in some cities as planned in 2009, the reported number of poor households could double or triple.

Urban poor households include specific social groups with distinctive difficulties and disadvantages. The first group includes a number of local poor households which are still facing characteristic difficulties. Oxfam (2009) found that the local poor shared distinctive disadvantages including disability, prolonged illnesses, elderly members, female heads of household, small children, or HIV/AIDS-infected members. Some of these households have working capacity but insufficient capital, knowledge or employment opportunities. Still, others did not even have working capacity and were unable to fend for themselves. This group of people could never escape poverty without special support given from the government.

The migrant poor group is fairly diverse, making urban poverty ever more complex than before. In previous years, migration was often a household income-generation strategy rather than an individual's livelihood decision (Anh *et al* 2003, Oxfam 2003). Migrants can be divided into two groups: migrant workers in factories or enterprises, and migrant informal

laborers. Many migrant households are either "poor" or "near-poor" as they are subjected to price fluctuations, insecure employment, unstable incomes and/or other external factors. On the other hand, some migrants can compete extremely well in the urban labor market and manage to escape poverty. However, even these migrants may face difficulties in accessing social services.

In addition, urban poverty is complicated because of the urban population's characteristic vulnerability. The boundary between the poor and non-poor is often blurred by "double-edged prices", unstable employment and incomes. The increasing flow of migrants with informal jobs into cities further pushes up the number of poor households defined by the capacity to meet own basic needs. More specifically, in the context of the global financial crisis since the latter half of 2008, migrant workers have been facing retrenchment and wage cuts.

Unfortunately, no statistical data are available for this particular group, resulting in limited observations which then affect in-depth analysis of urban poverty based on VHLSSs. Moreover, migrants are not included in official poverty surveys because they do not have formal residency in the cities. The complexity of the urban poor is therefore a challenge to effectively design and implement urban poverty reduction programs. In this context, a better understanding of the dynamics of urban poverty would be helpful. This would also serve as a good reference source for designing policies to reduce inequality for the urban poor. It would also be helpful to draw up support programs for specific disadvantaged groups because only such specifically-targeted programs can help the poorest groups to escape from poverty.

#### 5.4 Other knowledge gaps

*Gender inequality.* Differentials between the two genders in Vietnam have not been highlighted in this report but have been documented widely elsewhere (for instance, World Bank, 2006; Oxfam and AAV, 2008). The World Bank's Country Gender Assessment 2006 noted that Vietnam had been successful in closing up gender gaps in the last two decades while emphasizing the four areas in need of further attention. First, ethnic minority women lag behind both ethnic minority men and Kinh/Hoa women in access to healthcare and education services as well as economic opportunities. Second, there remains persistent gender stereotyping in textbooks which continues to perpetuate gender inequality. Third, greater recognition is needed with respect to the increasingly important role played by women in the agriculture sector, manifested firstly in the sheer number of women involved. Fourth, progress in increasing women's decision-making power has been slow and inconsistent.

While certain differentials between the two genders have been widely acknowledged and discussed, little light has been shed on the impacts of such differentials on the welfare of women. Pham and Reilly (2007) provided some insight on the impact of gender inequality on the earnings of female wage-receiving workers. The study reported a considerable but narrowing gender wage gap in the wage-receiving sector of Vietnam. Other studies have also discovered negative effects of having a female head of household on general household welfare (see Litchfield *et al.* 2008 for instance). However, there is little evidence on further developmental outcomes for *Invisible inequality*. Our current understanding on inequality is largely formulated based on data available from VLSSs, VHLSSs and a number of participatory poverty assessment (PPA) reports. It could be argued that there could be some "invisible" types of inequality that were not included in the above data sources. One example is the Gini indexes used earlier in this study. While the increasing trend in inequality is generally acknowledged, the Gini indexes tended to decrease from 2002 onwards. It thus seems very likely that the current literature does not capture sufficient or accurate enough data on the richest, especially those residing in big cities. One possible reason is that the VLSSs and VHLSSs series were designed according to the master samples drawn from the Population and Housing Censuses of 1989 and 1999 respectively. Therefore, these surveys excluded the newly-urban areas in big cities in their samples. Considering the pace of urbanization over the past two decades, it could be argued that huge investments have been poured into these areas, which are incidentally where wealthy families reside. If this portion is taken into account, it is likely that inequality indicators could change considerably. However, these arguments remain mere conjectures and further studies, especially those based on more representative samples, are clearly desirable.

In addition, as the economy has experienced an economic slowdown since 2008, there has been growing speculation that this slowdown has caused grave consequences to export growth, foreign investment flows and job security (and hence led to widespread unemployment) (see Nguyen Viet Cuong *et al.*, 2009). As the poorest are those least capable of coping with the economic downturn, it is likely that the current slowdown could affect poverty and inequality negatively. However, due to data constraints, these effects are not yet scrutinized.

#### 6. Implications for policy and conclusions

This paper has investigated the recent dynamics of inequality in Vietnam along a number of dimensions, specifically (i) consumption expenditure; (ii) income; (iii) landholding; (iv) educational attainments and achievement, and (v) access to basic public services. The paper also investigated whether an inequality trap exists in Vietnam or not. Evidence from the five VLSSs and VHLSSs showed that from 1993 to 2006, there was considerable inequality in household welfare but overall household welfare was improving. An examination of the Gini index finds that the index rose modestly in rural areas, but dropped slightly in urban areas. This means that the rural-urban inequality gap was narrowing, which could partly be attributed to rural-urban migration. Furthermore, the Theil L inequality index shows that in the 1993-1998, intra-region inequality was the main source of overall inequality but in the 2002-2006 sub-period, intraregion inequality was increasing. It is not surprising that most of the research focused on rural poverty rather than urban poverty since the urban poverty rate was much lower. However, this urban poverty rate was increasing slightly, posing a big question to policy makers. Urban poor households include specific social groups with distinctive difficulties and disadvantages. In addition, the urban poor population has become both more complex and more vulnerable due to rural-urban migration. It seems that government policies have not succeeded in helping the "hard core" among the poorest groups to escape from poverty.

Regarding inequality in education, Vietnam has steadily improved access to education for all groups over time. Statistics have proved that net enrolment rates for all education levels increased, such as from 34 percent in 1993 to 71.5 percent in 2006 for lower secondary level and from 9.8 percent to 42.7 percent for upper secondary level. However, the achievements gained still fail to solve "inequality of opportunity" across groups or regions of the country, especially for higher levels of education.

A much higher percentage of rural children than that of urban children was observed to have dropped out of schools before completing secondary education. Enrolment rates into upper secondary schools in 2004 and 2006 of ethnic minorities were only half of those of the Kinh/Hoa group. Furthermore, the gap between net enrolment rates across different education levels tended to widen among the minorities, implying that the door to higher education levels was much further out of reach for minority groups. Inequality in access to education was also substantial by regions. Net enrolment rates ranged from 47.4 percent to 78.4 percent (for lower secondary education) and from 28.6 percent to 56.2 percent (for upper secondary education) across the country. The Red River Delta had the highest enrolment rates for all education levels in all years of analysis, while the lowest enrolments were observed in the North West, the Central Highlands and the Mekong River Delta areas.

On the other hand, children of different family backgrounds could have very different educational opportunities. The head of household's level of education and occupation both influence their children's access to schools. In 2006, net enrolment rates of children from households with heads having finished upper secondary education were 2 to 3 times that of those from households with heads having lower education backgrounds. Children with parents working in the industry sector and the service sector were likely to have more opportunities to access higher education while those with parents working in the agriculture sector tended to have more limited access.

Family income also greatly influenced educational opportunities of the children. In 2006, net lower secondary enrolment rate of the highest income quintile was 54 percent higher than that of the lowest income quintile, while net upper secondary enrolment rate of the highest income quintile was nearly four times that of the lowest income one. In addition, poorer households were found to be likely to refrain from spending on education for their children while the richer households tended to increase their concentration of expenditures. This unbalanced spending distribution has reinforced "inequality of opportunity" in access to education.

In order to examine whether inequality exists in household landholding - the most important asset of rural households - and in access to public services, various statistics on average land endowment and access to key infrastructures as well as basic services were calculated based on data from VLSSs and VHLSSs. In all of these, however, we found little evidence of inequality as there were few considerable differences in land endowment and access to infrastructures and public services across geographic regions and even, in some cases, across ethnic groups. However, the average figures calculated may have excluded certain aspects of inequality. Regarding landholding, VHLSSs did not provide sufficient information on land quality, a crucial factor in agricultural productivity that very likely varied across regions and ethnic groups. In addition, it is not feasible to evaluate quality of access to infrastructures or to public services, which led to the false appearance in calculated statistics that access to these facilities was relatively equal across regions and ethnic groups. In reality, there could be substantial differences in the quality of access especially between that of the Northern Uplands or the Central Highlands and the national average; or between that of ethnic minorities and that of the Kinh/Hoa group. These differences could also represent sources of inequality. Unfortunately, further investigation into these sources is unlikely due to data constraints.

The analysis on healthcare services provided little evidence that there existed considerable inequality in access to healthcare facilities across different groups. Inequality in access to the

health insurance scheme existed but seemed to have been compensated for by government programs providing healthcare or health insurance subsidies to the less privileged or the ethnic minorities. The patterns shown in the concentration curves of healthcare expenditure over the years do not suggest any increase in "inequality of opportunity" between the privileged and the less privileged.

The study has shown some evidence of an inequality trap – when inequality in education may not only be affected by the differences in efforts, talents, and luck, but also some other external factors beyond people's control. The "uncontrollable" variables of gender, birthplace and ethnicity were found to bear certain influences on the children's educational opportunities. Income inequality was also found to interact with and reinforce inequality in education as well as in access to healthcare facilities.

The analysis undertaken to generate the primary findings presented in this report suggested a number of deeper questions to which answers are needed. Given the short time horizon envisaged for this paper, it will not be possible to satisfactorily address all of those potential questions here. Nevertheless, rather than ignoring them, it is useful to list the key unanswered questions in need of attention in this section, in the hope that future analysis may be able to resolve them. Inequality in the "pockets of poverty" is considered the first knowledge gap. As poverty is now concentrated in several "pockets of poverty", the resultant inequality in consumption expenditures, physical assets, and access to services between the poor living in these "pockets of poverty" have not been well researched into. What matters about these "pockets of poverty" is that it will be considerably more difficult for Vietnam to achieve the same rate of poverty reduction as it has done over the past two decades. Consequently, inequality between the poor and the "average poor" in these "pockets" is likely to become increasingly persistent.

Another knowledge gap that warrants future research is ethnic inequality (i.e. inequality across ethnic groups). Ethnic minorities seemed to have experienced lower rates of poverty reduction than the general population did. What is worrying is that the proportion of ethnic minorities in the poor population was monotonically increasing over time. Despite the continuous support from the Government and donors over the past two decades, the gaps in per capita household expenditure between Kinh-Hoa households and ethnic minority ones still widened over time from 47 percent in 1993 to 74 percent in 2006. There are a number of studies that have tried to provide an explanation for the fact that ethnic minorities tend to be left behind all other groups. Most of these studies attributed at least half of the total welfare gap between the Kinh/Hoa group and other ethnic minorities to "differences in returns to endowment". However, there has yet been any satisfactory explanation for what drives these differences.

Urban poor households include specific social groups with distinctive difficulties and disadvantages. The first group includes a number of local poor households which are still facing characteristic difficulties. The migrant poor group is fairly diverse, making urban poverty ever more complex than before. Unfortunately, no statistical data are available for this particular group, resulting in limited observations which then affect in-depth analysis of urban poverty based on VHLSSs. Moreover, migrants are not included in official poverty surveys because they do not have formal residency in the cities. Therefore, inequality experienced by the urban poor is another area in need of future research.

## **Technical Appendix**

# Table A-1: Summary of the differences in characteristics covered by the different household surveys conducted

Name	Data collection period	Sample size	Household questionnaire length	Minimum level of representativeness	Types of data collected
1993 Vietnam Living Standards Survey	1992-1993	4,800	110 pages	7 regions	Household member characteristics relating to education, health, employment, migration, housing, fertility, agriculture, non-farm self- employment, expenditure, assets, other income, savings and credit.
1998 Vietnam	1997-1998	6,000	110 pages	Ten strata (7 rural	Almost identical
Standards				and 3 urban areas)	content and structure
Survey					VLSS.
2002 Vietnam Household Living Standards Survey	2002 Vietnam 2002 Household Living Standards Survey		43 pages	Urban and rural areas of eight regions	Similar to VLSS but excluding migration, anthropometrics, savings, and credit items. Other items were also simplified.
		75,000	36 pages	61 provinces	Similar to the previous small-sample VHLSS but excluding expenditure.
2004 Vietnam Household Living Standards Survey	2004	46,000 HHs in 2004 (including 9,300 HHs that reported about their expenditure)			Similar to 2002 VHLSS but made two additions into the household questionnaire: more details on land and agriculture, forestry and aquaculture production were added onto section 9 while an entirely new section is added on non- farm self-employment activities. Moreover, section 8 was expanded to cover borrowing and lending patterns as well.
2006 Vietnam Household Living Standards Survey	2006				Health and education was added to the basic core of the questionnaires.

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3

## **Ethnic Minority Poverty in Vietnam**

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#### **1. Introduction**

This background paper for the 2008-09 Vietnam Poverty Update report presents descriptive and multivariate analysis on ethnic minority poverty in Vietnam. The primary data sources used for the analysis comprise the Vietnam Living Standards Surveys (VLSS) of 1993 and 1998 and the Vietnam Household Living Standards Surveys (VHLSS) of 2002, 2004 and 2006. However, other quantitative and qualitative sources are used to triangulate and deepen the analysis where relevant. After this introduction, Section 2 of the paper aims to develop a picture (or profile) of ethnic minority poverty in Vietnam using both monetary (expenditure-based) and non-monetary (nutrition and education) measures. Section 3 conducts multivariate analysis of the correlates of minority and majority (Kinh-Hoa) living standards and decomposes these into differences in characteristics and differences in returns to those characteristics. Section 4 reconsiders Vietnam's policies for ethnic minority development in the light of these findings, and suggestion some additional interventions and measures which may help to close the widening gap between the living standards of the majority and minorities. Section 5 concludes.

#### 2. A Picture of Ethnic Minority Poverty

Although poverty is a multi-dimensional concept, and has important non-monetary dimensions, we start by describing the poverty of the 52 ethnic minority groups in Vietnam using a conventional expenditure-based metric. Figure 1 shows the poverty headcount (that is the percentage of the population whose per capita expenditures are below the GSO-WB poverty line) fell from 54% in 1993 to 10% in 2006 for the majority Kinh and Hoa, while poverty started at a higher level (86%) and fell more slowly (to 52%) for the ethnic minorities.



Figure 1: Poverty Headcount (%) for the Kinh and Hoa versus the Ethnic Minorities

Source: Own calculations based on VLSS and VHLSS

The reason for the rapid reduction in headcount poverty experienced in Vietnam, especially by the Kinh and Hoa, can be seen by examining the distribution of expenditures in Figure 2 below. Panels 1a and 1b show the distribution of per capita expenditures of for the Kinh and Hoa (solid line) and the other 52 ethnic minority groups (dashed line). The poverty line, using the GSO and World Bank criterion, is also super-imposed on these densities.<sup>1</sup> The mode of the expenditure distribution for the Kinh and Hoa can be seen to have moved from just below the poverty line in 1993 to some way above it in 2006, while that for the ethnic minorities has moved to the right but remained below the poverty line in 2006. This provides the statistical explanation of why the poverty headcount for the Kinh and Hoa in Figure 1 fell some much faster than for the ethnic minorities between 1993 and 2006. Note that this is both good and bad news as far as the ethnic minorities are concerned, as equitably distributed economic growth in upland areas can reduce ethnic poverty dramatically by moving the mode of the minority distribution over the poverty line while leaving most of these households vulnerable to falling back to poverty again due to household, community or economy wide-shocks. We estimate that if their per capita expenditures increased in line with real agricultural GDP growth (of 7.2%) between 2006 and 2008, the poverty headcount among ethnic minorities will have fallen to 47.1% by 2008. However, 8 % of these minority people would fall back into poverty again if their projected 2008 expenditures then fell by 10% due to a shock.<sup>2</sup>

<sup>1.</sup> There are two poverty lines in common use within Vietnam: the GSO-World Bank poverty line (which is based on a standard cost-of-basic-needs methodology and estimated from the V(H)LSS) and the MOLISA poverty line (which is used for targeting and monitoring the number of poor households at the commune level).

<sup>2.</sup> So the poverty headcount for ethnic minorities after the shock would rise to 55.1%. The comparable poverty figures for the Kinh and Hoa are: 7.9% (7.2% agricultural growth) and 11.5% (10% shock). Note that these calculations assume that growth is distributionally neutral (i.e., in equality does not increase or decrease). It has been necessary to project poverty forward in these ways, because the 2008 round of the VHLSS has been completed but not yet released.

#### Figure 2: Expenditure Distributions for the Kinh-Hoa and the Minorities



Source: Own calculations based on VLSS93 and VHLSS06

Note also that the distribution for both the Kinh-Hoa and ethnic minorities in Figures 2a and 2b become less peaked and more dispersed, confirming the moderate rise in inequality (especially between rural and urban areas) that has occurred over the last decade and a half (Pham et al., 2009). There is, however, little evidence from these expenditure distributions of a rise in polarisation (that is separate groups of the poor and rich emerging).<sup>1</sup>

Most previous work has highlighted disparities in living standards between Kinh and Hoa and the 52 minority ethnic groups. This simple majority/minority dichotomy potentially conceals important differences between individual ethnic groups. However, there are insufficient observations in the VHLSS to estimate statistics for most ethnic groups individually. We therefore adapt the categorization used by Baulch, Pham and Reilly (2006) and identify 6 ethnic categories to examine the disparities between (different dimensions) of ethnic minority living standards in what follows. This categorization is based on grouping the livelihood rather than cultural characteristics of the individual ethnic minority groups and, while far from perfect represents the best compromise between the desire for greater disaggregation and the limitation of the VHLSS's sample size.

The snapshot of poverty measures and median expenditures in Table 1 shows that some ethnic categories, in particular the Other Northern Uplands and Central Highland minorities, are considerably poorer in expenditure terms than the Tay, Thai, Muong, and Nung, who are in term poorer than the Khmer and Cham.<sup>2</sup>

<sup>1.</sup> Between 1993 and 2006, the Duclos, Esteban and Ray measure of polarization rose from 0.216 to 0.226 with  $\alpha$ =0.5 and decreased from 0.183 to 0.180 with  $\alpha$ =1. These are relative modest changes. See Duclos, Esteban and Ray (2005) for an introduction to these and other polarization measures.

<sup>2.</sup> Note that these poverty headcount and mean expenditures for these four ethnic categories are statistically different from one another at the 1 % level. This is not the case for the residual 'Other category' which contains just 28 households.

Ethnic Category	Poverty Headcount	Poverty Gap	Median PC Expenditures	Observations
Kinh-Hoa	13.5%	2.7%	VND 4.267	5,875
Khmer-Cham	34.6%	5.8%	VND 2.819	122
Tay-Thai-Muong-Nung	45.2%	11.1%	VND 2.729	420
Other Northern Uplands	72.4%	26.1%	VND 1.878	239
Central Highlands	73.6%	25.7%	VND 1.955	198
Others	50.1%	23.5%	VND 1.942	28
Total	20.4%	4.9%	VND 3.936	6,882

## Table 1: Poverty Headcount, Poverty Gap and Median Per Capita Expenditures,Rural Areas 2006

Source: Own calculations based on VHLSS06

It is also useful to show the deviation of the mean per capita expenditure of the six ethnic categories from their annuals mean in the last round of the VLSS and first three rounds of the VHLSS survey (Figure 3). As can be seen the Kinh and Hoa have mean expenditures above mean in years, and this difference has been growing over time. In contrast, the other five ethnic minority categories have mean expenditures that are below the mean, and the relative position of the Other Northern Minorities and Central Highland minorities has been declining substantially over time. In contrast, the deviation for the Khmer and Cham and Tay, Thai, Muong and Nuong are varying over time, although the former are always closer to the annual mean than the latter.<sup>1</sup> These disparities in living standards between ethnic groups are confirmed in a number of other qualitative and quantitative studies (Hoang et al, 2007; Oxfam and Action Aid, 2008; Uplands Program, 2007; World Bank 2009).

<sup>1.</sup> Again, because of their small sample size, not too much should be read into the results for the others category.



Figure 3: Ethnic Expenditure Differentials, 1998-2006

People belonging to the six different ethnic categories in Table 1 and Figure 3 have different levels of Vietnamese language proficiency. The Kinh obviously speak Vietnamese fluently, as do the vast majority of Hoa, and Tay, Thai, Muong and Nung people. However, Vietnamese language ability is generally lower among many of the Central Highlands and Other Northern Uplands categories. While the V(H)LSS questionnaires do not ask about people's fluency in Vietnamese directly, whether or not a household was interviewed using an interpreter can be used as a rough proxy for their Vietnamese language ability. Calculations using the VHLSS06 show that rural ethnic minority households who can't speak Vietnamese well (and were therefore interviewed via an interpreter) are 1.9 times more likely to be poor than ethnic minority households who can speak Vietnamese, and 7.9 times more likely to be poor than Kinh and Hoa living in rural areas. Analysis of the data from the recent Program 135 II baseline survey also found that "those [households] who had no or limited Vietnamese language ability were found amongst the poorest", while "those who spoke only Vietnamese or both Vietnamese and ethnic minority languages were found similar in terms of poverty rate" to the Kinh (Pham et al., 2008). A number of qualitative studies testify to the powerful influence that low ability in Vietnamese has on the ethnic minorities, in particularly ethnic minority women, to access employment (Oxfam et al., 2008), government services (VASS et al, 2009), engage in markets (World Bank, 2009), and receive social transfers.

Before we move on to non-monetary indicators of poverty, it may be worth examining one final aspect of ethnic minority expenditures concerning the share of festival and other holiday expenditures. Various anthropological studies (Dang et al., 2000; \*\* add further references) have argued that festivals are an important part of ethnic minority culture and living standards. However, the evidence from the VHLSS06 is mixed (Figure 4). While the ethnic minorities

Sources: Own calculations based on VLSS and VHLSS

spend 13% more on food during festivals, the share of their festival expenditure on weddings is about the same, and on funerals much less than the Kinh and Hoa. Furthermore, in absolute terms the total amount the minorities spend on festival expenditures is less than the Kinh-Hoa (a mean of VND 1.7 versus VND 2.2 million per household in 2006).<sup>1</sup>



#### Figure 4: Festival Expenditures by Ethnicity, Rural Areas 2006

We now turn to examining some selected indicators on non-monetary welfare, starting with nutritional indicators for children under-fives and then moving on to educational enrolments and drops-outs for children, employment, income and mobility, and, finally, public services and social benefits.

#### Ethnic Minority Nutrition

Health, especially of children, is well reflected by nutrition status. As part of the effort to analyse the ethnic gap in Vietnam, we have calculated two nutrition indicators using the VLSS98 and VHLSS06 surveys:<sup>2</sup> stunting and wasting for children aged 0-59 months. The reference standards used are the latest World Health Organisation's child growth standards (WHO, 2006). In addition, we report data from other studies on breastfeeding and weaning practices and micronutrients deficiencies and discuss how these relate to ethnic minority nutrition.<sup>3</sup>

Children whose height-for-age is more than two and three standard deviations below the median of the reference population are considered to be stunted and severely stunted, respectively. Stunting is a reflection of chronic malnutrition as a result of failure to receive adequate nutrition over a long period and recurrent or chronic illness (GSO, 2006).

Source: Own calculations based on VHLSS06

<sup>1.</sup> Note the festival expenditure module of the VHLSS06 questionnaires may not capture expenditures on ethnic minority festivals as well for Tet.

<sup>2.</sup> Note that anthropometrics modules were not included in the 2002 and 2004 VHLSS. We are grateful to Nguyen Bui Linh, who used the WHO Anthro (version 2.02) to calculate Height-for-age and Weight-for-height z-scores from VLSS98 and VHLSS06 data.

<sup>3.</sup> Most other studies of nutrition in Vietnam, including the National Institute of Nutrition's annual surveys and the GSO-UNICEF MICS surveys, do not disaggregate their results by ethnicity.

Wasted children are the ones whose weight-for-height is more than two standard deviations below the median of the reference population. Wasting is usually the result of a recent nutritional deficiency. Changes in wasting rates often reflect seasonal changes in food availability or the incidence of disease (GSO, 2006).

As shown in Table 2, Vietnam has made substantive progress in reducing stunting among children under five, although severe stunting among this age group has not changed. Furthermore, wasting rate has increased by 1% both for children under five years old and by 4% for children under 24 months. The latter difference is statistically significant at the highest levels. These results are consistent with recent annual surveys by the National Institute of Nutrition, which found that 32.6% of children under five were stunted in 2008 (NIN, 2007). A probable explanation for the increase wasting is that many infants in urban aeras are bottled rather than breast-fed and that those who are breast-fed are weaned too early.<sup>∞</sup> The recent 2006 Multiple Indicator Cluster Survey (GSO and UNICEF, 2006), found that only 17 percent of children aged less than six months were exclusively breastfed, with the percentage of exclusive breastfeeding being much higher in rural areas than in urban areas. This suggests that young children's nutritional status might be improved by encouraging breastfeeding and allowing working mothers in urban areas to have longer maternity leave.

Poor complementary feeding makes children under 24 months of age lose weight very quickly, so their weight-for-height will go down. Disease (especially diarrhoea) also makes young children lose weight. The 2006 MICS results show the peak of diarrhoea prevalence in the weaning period, among children age 6-23 months. That suggests more attention to be given to the type of weaning foods given to children under 24 months of age. Acute respiratory infections are also one of the correlates of nutritional status among children. While mothers' knowledge, which is correlated with their education, is determinant for health-seeking behaviour, the 2006 MICS results show only 9 percent of women knew about the danger signs of pneumonia. Therefore, attention is also need to raise mothers' awareness of hygiene and disease prevention.

	< 60 months			<24 months			>=24 months & < 60 months		
	1998	2006	2 sample mean comparison test (P-value)	1998	2006	2 sample mean comparison test (P-value)	1998	2006	2 sample mean comparison test (P-value)
Stunting	42%	34%	0.0000	32%	26%	0.0000	48%	38%	0.0000
Severe stunting	13%	13%	0.1817	11%	11%	0.0000	15%	14%	0.0009
Wasting	11%	12%	0.0000	11%	15%	0.0000	11%	10%	0.0000
Ν	2,149	1,956		757	662		1,392	1,294	

#### Table 2: Nutrition Indicators for Children Under Five in the Whole Country

Sources: Own calculations based on VLSS98 and VHLSS06
Although the nutritional status of Vietnam children is quite consistent with other countries in the region at the same level of development (Table 3), national under five stunting rates are high and put Vietnam among the world's 20 worst performers in child nutrition (Vietnam News, 2008 quoting NIN). That the incidence of stunting in China and Thailand is around a third of that in Vietnam, suggests that there is considerable scope for improving the height-forage of Vietnam's children.

	wasting, moderate & severe	stunting, moderate & severe	Vitamin A supplement -ation full coverage	% of households consuming Iodised salt
Cambodia	7	37	76	73
China		11		94
Lao	7	40	69	75
Mongolia	2	21	95	83
Myanmar	2	21	94	83
Philippines	6	30	83	45
Thailand	4	12		47
Vietnam*	12	34	95	93
India	19	38	33	51

## Table 3: Nutrition Status of Children Under-Five, 2000-200

Source: UNICEF (2009) except \*, which are own calculations based on VHLSS06

Reliable statistics on micronutrient deficiencies are hard to come by for most East Asian countries. However, the situation in Vietnam is probably not as favourable as the situation revealed by the available cross-country statistics (last two columns of Table 3). While Vietnam has (along with Mongolia) the highest rate of full coverage of Vitamin A supplementation for children aged 6 to 60 months, this also suggests that the need for Vitamin A supplementation is high.<sup>1</sup> The 2006 MICS survey found only 32.5 percent of mothers with a birth in the past two years had received a Vitamin A supplement within eight weeks of the birth. This number is significantly higher for the Kinh (35.2 percent) than other ethnic groups (19.2 percent) (GSO and UNICEF, 2006). A recent study of 1,657 children under five in four regions found the prevalence of sub-clinical vitamin A deficiency was 12% and the prevalence of amenia (iron deficiency) was 28%, with children under 6 months old and those living in the Northern Mountains being the most severely affected (Khan et al, 2007). Small scale studies indicate extremely high level of micronutrient deficiencies in some ethnic minority areas. For example, in three mountainous areas of rural Thai Nguyen, Nhien et al (2008) found 79% of preschool children suffered from at least two micronutrient deficiencies with 56% suffering from anemia (iron deficiency) and 11 being Vitamin A deficiency. Selenium and zinc deficiencies were even higher (at 62 and 87% respectively). The percentage of households consuming iodised salt has

<sup>1.</sup> Vitamin A is essential for eye health and proper functioning of the immune system

also likely fallen since late 2006, when the compulsory iodisation of salt was abandoned. As discussed in Section 3, bio-fortification of staple foods together with fortification of other basic foodstuffs, has considerable potential to decrease micronutrient deficiencies in Vietnam.

Table 5 disaggregates stunting and wasting rates by ethnicity for children under 5 in rural areas. As the pattern of growth failure varies according to age, with wasting being more common among children under 24 months and stunting observed more clearly among children over 24 months (Young and Jaspers, 1995), we calculate nutrition indicators separately for children under 24 months and from 24 months to 59 months.<sup>1</sup> The Kinh-Hoa ethnic category has done very well in reducing their stunting rates for the period 1998-2006 for both age groups, with stunting rates reduced by 7 and 16 percentage points, respectively. The ethnic minorities also made some progress reducing stunting by 2 percentage points for children under 24 months, although this difference is not statistically significant at conventional levels. However, stunting among ethnic minority children older than 24 months, and wasting among minority children less than 24 months increased by 3 and 5 percent respectively. These differences are statistically different at the one percent level. Finally, a 1 percent reduction in wasting among both Kinh-Hoa and minority children over 24 months old was observed between 1998 and 2006. Again these differences are statistically significant at the highest levels.

<sup>1.</sup> Sample size considerations do not permit further disaggregation by age and ethnicity.

Table 4: Nutrition Indicators for Children under Five by Ethnicity in Rural Areas, 1998 and 2006

		Two groups mean comparison test P-value	0.0000	0.0000	
	2006	Kinh/ Hoa	37%	11%	752
onth		Ems	57%	10%	284
>=24 m		Two groups mean comparison test P-value	0.0033	0.0000	
	1998	Kinh/ Hoa	53%	12%	845
		Minorities	54%	11%	249
		Two groups mean comparison test P-value	0.0000	0.0000	
	2006	Kinh/ Hoa	27%	15%	356
nonths		Minorities	33%	18%	171
<24 m		Two groups mean comparison test P-value	0.3442	0.0000	
	1998	Kinh/ Hoa	34%	11%	446
		Minorities	35%	13%	140
	Rural only		stunting	wasting	N

	æ	wo sample mean omparison sst P-value	0.0000	0.0000	
Kinh/Hoa	T 2006 cc	37%	11%	752	
onth		1998	53%	12%	845
>=24 m	ities	Two sample mean comparison test P-value	0.0000	0.0000	
	Minori	2006	57%	10%	284
		1998	54%	11%	249
	Ioa	Two sample mean comparison test P-value	0.0000	0.0000	
	Kinh/F	2006	27%	15%	356
onths		1998	34%	11%	446
<24 m	ities	Two sample mean comparison test P-value	0.0936	0.0000	
	Minor	2006	33%	18%	171
		1998	35%	13%	140
		Rural only	stunting	wasting	Z

Sources: Own calculations based on VLSS98 and VHLSS06

Figure 5 presents the stunting, severe stunting and wasting rates for the six ethnic categories in the rural area only. The Kinh-Hoa and Khmer and Cham have done well in improving their height-for-age thereby reducing moderate stunting by 13 and 16% respectively. Wasting has also decreased by 6 percentage points among the Khmer and Cham. These changes are statistically significant at the highest levels. However, the nutritional status of the other four ethnic categories worsened between 1998 and 2006, with stunting among the Central Higlands increasing by 7% and wasting among the Other Northern Minorities rising by 4%, Surprisingly, the Thay-Thai-Muong-Nung's stunting and wasting rates also increased by 5% and 4% respectively.<sup>1</sup>

Figure 5 also shows that the Kinh-Chinese made no progress in reducing severe stunting. Severe stunting rates worsened for all other ethnic categories except for the Khmer and Cham and the Central Highlands minorities, although because of sample size issues only the increase in severe stunting among the Tay-Thai-Muong-Nung is statistically significant at conventional levels. This should be a cause for concern, as severe stunting in young children is very hard to reverse and is likely to lead to short stature and lower intelligence in adult life (Martorell et al., 1992). Group mean tests among the five ethnic groups show that moderate and severe stunting rates are jointly different from each other at the 1% level in 2006, and statistically different from each other at the 1998.

<sup>1</sup> All these changes are statistically significant at the 1% level, although the reduction in moderate stunting for the Other Northern Minorities is not (see Appendix Table)

# Figure 5: Nutrition Indicators for Children Under Five by Ethnic Category, 1998 and 2006





Sources: Own calculations based on VLSS98 and VHLSS06

There are many factors which affect the nutrition of children (Haughton and Haughton, 1997). Therefore the poor nutritional indicators observed for ethnic children may stem not only the lower living standard that their households have compared with the majority counterparts, but also many other factors such as parents' height, women's nutrition status when entering the pregnancy and during the first trimester, mothers' education, living environment, worm loads and the incidence of infections, especially diarrheal, diseases. For ethnic children living in upland and mountainous areas, their high malnutrition rates may also relate to geographical remoteness. In these areas, where maternal mortality and micronutrient deficiencies are also high, efforts to reduce child malnutrition should focus on improving the nutrition of women before and during pregnancy, as well as of children in their crucial first two-years of life.<sup>1</sup>

Finally it should be noted that although parents in Vietnam, especially in rural areas, prefer having sons to girls, there is no evidence of bias against the girls in nutrition. In fact, if anything, nutrition is worse amongst boys than girls, especially during the first two years of life (Appendix Table 2 and Appendix Table 3).

<sup>1.</sup> It is well-known that poor nutrition in vitro and during the first two years of life leads to irreversible damage in later life (Martorell et al, 1992)

#### Ethnic Minority Education

If the living standards of the ethnic minorities are to catch-up with those of their Kinh-Hoa counterparts, it is essential that their educational standards are improved. This sub-section discusses the education enrolments and school dropouts using the VLSS98 and VHLSS06 data combined with administrative data for the post-secondary level. While such an analysis is obviously partial – it does not, for example, discuss the quality of the education received or the standards students attain–it nevertheless reveals that the educational disadvantages experienced by ethnic minority children and young people cumulatively increase with age, which it turn makes it extremely difficult for them to access wage employment. Some policy measures that may help to counter-these cumulative educational disadvantages are suggested in Section 3.

Figure 6 shows enrolment rates for primary, lower secondary and upper secondary school age children in rural areas calculated using the VLSS98 and VHLSS06. Although there has been little change in overall primary NER for rural areas between 1998 and 2006, the percentage of primary school age children enrolled from the ethnic minorities has increased by just over 2%.<sup>1</sup> Primary NERs among children from the Central Highland Minorities and also the residual Others category have increased by around 30%. Nevertheless, inspection of their GER shows that, large numbers of children from the Central Highland minorities and especially the Khmer and Cham go to primary school late.<sup>2</sup>



#### Figure 6: Net Enrolment Rates, Rural Areas

Source: Own calculations based on VLSS98 and VHLSS02-06

<sup>1.</sup> To reflect school enrolment practices in Vietnam, these NERs have been calculated using the year of birth of child rather than their age at the time of interview,

<sup>2.</sup> Rural primary GERs among the Central Highlands minorities and Khmer and Cham in 2006 were 110.8% and 120.2% respectively compared to 102% for the Kinh and Hoa. See Appendix 1 for details.

Net enrolment rates by ethnicity can be analysed at a more disaggregated level (Figure 7). At the lower secondary school level, NER have increased by at least a fifth for all ethnic groups, with the Other Northern Upland and the Central Highlands minorities each recording improvements of around two-fifths. Nonetheless, these two ethnic categories remain educationally disadvantaged with less than half of their children attending lower secondary school in the right age range. Almost two-fifth of the children from the Other Northern Uplands minorities who attend lower secondary school do so late.

The disparities between net enrolment rates become most pronounced at the high school level, where almost 60% of Kinh and Hoa children attend upper secondary school compared to just under 10% for the Khmer and Cham. Upper secondary school enrolments are also under 20% for the Other Northern Minorities and the Central Highland Minorities.



Figure 7: Net Enrolment Rates by Schooling Level, Rural area, 1998 and 2006

Source: Own calculations based on VLSS98 and VHLSS06

We can explore the reasons underlying these differences in enrolment rates by examining the pattern of school drops by age and ethnicity (Figure 8). As one would expect, most school drop-outs occur during the transitions from primary to lower secondary school and from lower to upper secondary school. However, as can be seen from Figure 8, a large number of pupils from the Other Northern Minorities drop out between Grades 2 and 3. In mountainous areas, this corresponds to the age at which children usually need to move from village classrooms to the main primary school (usually located in the commune centre). In the Northern Uplands, studying in the main primary school often involves a walk of an hour or more to the commune centre, which obviously acts as a disincentive for children from outlying village attending primary school. Furthermore, as the Other Northern Minorities are more likely to live in outlying villages than the Tay-Thai-Muong-Nung, children from the ONM are disproportionately affected. Among pupils from the Central Highland minorities, drops-outs are highest between Grades 6 and 7, especially for girls. This age roughly correspond to the age of menarche and also of marriage (or bethrothal) for some ethnic groups. For Khmer and Cham pupils, drop-outs are highest between Grades 4 and 6. By Grade 10, there are so few Khmer and Cham enrolled in school that drop-outs become minimal.





In comparison with the rural areas in general, more pupils drop out during the primary level in remote areas (defined as communes belong to socio-economic development region (*vung* 3). As can be seen from Figure 9, the situation is worse for the girls, many of whom cannot finish primary school in remote communes. Girls from the Central Highlands and Other Northern Uplands minorities tend drop out at during Grades 2 and 3 grades, which probably corresponds to the point at which pupils have start studying in the commune school rather than village classrooms. In contrast, for the Khmer and Cham and Tay-Thai-Muong-Nuong pupils in remote communes, drop-outs peak in Grades 4 and 5 and there are not clear differences between boys and girls.

Source: Own calculations based on VHLSS06





A recent survey in three provinces with large ethnic minority populations for the World Bank's Country Social Assessment (World Bank, 2009) showed around 30% of minority households reported at least one child had dropped out of school before the completion of a grade, compared to 16% for the Kinh. Survey respondents argued that minority students drop out of school for many, mutually enforcing reasons including: poverty, long distance to school, lack of self-esteem, language barriers, poor nutritional status, and the high opportunity costs of current time (arguing that the costs are born now whereas potential benefits can only be reaped in the long term, by which time they will be heavily discounted). The role of language barriers in school drops outs particularly deserves stressing. The CSA survey found that the vast majority of ethnic minority children speak their own languages at home and argues that 'Many minority children start their first day of primary school unprepared for instruction in Vietnamese.' While the extension of pre-school and pre-sessional summer classes can do much to help prepare four and five years olds to start learning in Vietnamese, it is unlikely that many of them will be able learn adequately in Vietnamese by the age of six.<sup>1</sup> Additional support in Vietnamese for ethnic minority students whose mother tongue in not Vietnamese is therefore extremely important in, at a minimum, Grades 1 and 2.

The quality of the school which ethnic minority children attend is also clearly a vital, although reliable data on school quality is rarely available. Swinkels and Turk (2006) report on an assessment of learning outcomes in 3660 schools across the country shows that a combination of lower quality teaching, poor facilities, long travel times and language issues mean that Grade 5 children in ethnic minority areas are learning less than those in other parts of the country.

Source: Own calculations based on VHLSS06

<sup>1.</sup> In one North-western province which two of the authors visited in 2007, ethnic minority children from remote communes were given just 36 half-day summer classes before being expected to learn entirely in Vietnamese!

It concludes that the ethnic minority pupils need to start school earlier and repeat grades less and the schools in the isolated areas should be better resourced to overcome the deficits of their intake of pupils. There is also evidence that schools in the poorest communes where most of ethnic minorities live are in much poor physical condition than the average. Pham *et al.* (2008) using the P135-II's baseline survey documented the most difficulties to education access perceived by households in the P135-II communes. Their results show that at the primary education level, insufficient physical facilities were identified as the most serious obstacle by 85 percent of the P135-II communes. Limited school budgets and poor living conditions for teachers were ranked as the second more important difficulty in 42 percent of these communes. While the number of ethnic minority teachers is increasing, most ethnic teachers have received insufficient training in teaching methods, according to the Head of Department for Ethnic Minority Education in the Ministry of Education and Training (Vietnam News, 3 September 2008). As a result, in some research sites of the World Bank Country Social Assessment, ethnic teachers said that "they were perceived by their principals to be "less qualified" and worse teachers and given subordinate jobs or administrative work" (World Bank, 2009).

At the post-secondary level, it is not possible to disaggregate into the six ethnic categories. However, the Ministry of Education and Training's statistics show a stark contrast between the percentage of Kinh and ethnic minority students (Figure 10). Compared to their 12.1% population share in the 1999 Census, only 1.3% of post-secondary students in the 1999-2000 school year were from the ethnic minorities (and only 19% of these were attending college or university). Although by 2006-07, the number of ethnic minority students had almost doubled to 51,514 students, young people from the ethnic minorities still make up just 2.5% of all post-secondary students (compared to their population share of approximately 16 to 17%).<sup>1</sup>



#### Figure 10: Percentage of Ethnic Minority Students in Post-Secondary Education

Source: http://www.edu.net.vn

<sup>1.</sup> The exact share of the ethnic minorities among young people of post-secondary age will not be known accurately until the results of the 2009 Census become available. In the 1999 Population and Housing Census, the share of ethnic minority in young adults aged 18 to 22 years was 13,7% (GSO, 2001).

Taken together these figures show a situation in which the educational standards of the ethnic minorities, while improving, lag seriously behind those of their Kinh-Hoa counterparts. Furthermore, the educational disadvantages experienced by ethnic minority children and young people cumulatively increases with the level of schooling. Thanks to the considerable investments made at this level in recent years, primary net enrolment rates for all ethnic categories are 80% or higher. However, the Other Northern Minorities and Central Highland Minorities still have net primary enrolments rates that are around 13% lower than the rural Kinh and Hoa. These groups also tend to enrol in primary school later than their majority counterparts. The educational attainment gap opens opens-up further for these two groups at the lower secondary school level, and starts to open up for the Khmer and Cham at this level too. By the time they reach high school age, less than a quarter of all ethnic minority teenagers are attending upper secondary or professional schools, and a gap is also opening-up between the Tay-Thai-Muong-Nung and the Kinh-Hoa. As a consequence just 2.5% of post-secondary students in Vietnam come from the ethnic minorities.

### Employment, Incomes and Mobility

Table 5, which is based on analysis of the 2007 Labour Force Survey, shows that in rural areas the ethnic minorities are about two-and-a-half less likely to be wage workers than the Kinh. The minorities are also much less likely to have written contracts of employment, receive pay slips, or have social security benefits (VSI). In Vietnam as a whole, the Labour Force Survey shows that non-Kinh (that is the minorities plus the Hoa) receive much lower labour income that the Kinh. However, it is important to note that the non-Kinh figure in this table is substantially improved by the presence of Hoa workers, who earn much more (and also work substantially longer hours) than the Kinh.

	Kinh	Ноа	Minorities
Rural Areas			
Wage Workers (%)	25.8	17.7	10.3
Written Contract (%)	12.1	7.6	4.8
Pay Slip (%)	12.7	9.1	4.8
Social Security (%)	9.0	6.0	4.0
Rural & Urban Areas	Kinh	Ноа	Non-Kinh
Labour Income (VND million)	1.108	1,795	0.699
Hours/week	44	50.1	43.2
Sample size	275,543	3,163	44,513

# Table 5: Characteristics of Main Job by Ethnicity, 2007

Source: Roubard (forthcoming)

Part of the reason for why the minorities have less access to wage employment and have less diversified income sources more generally is that they are much less mobile than the Kinh and Hoa. There are obviously many different aspect to mobility (geographic, economic, social) but the one we focus on here is geographic mobility. The World Bank's Country Social Assessment (2009) argues that early government migration programs tended to favour the Kinh, although in recent years much of migration to the Central Highlands has involved both Kinh and (certain) Northern minorities. Once they have migrated, the CSA's household survey in Dak Lak showed that Kinh migrants are also much more likely to have received government support or land allocations compared to the minority migrants (World Bank, 2009).

Figures from GSO's 2004 Migration Survey in Table 6, which was conducted in selected provinces and like the CSA's survey are not nationally representative, shows that the vast majority of migrants are Kinh, as would be expected by their population share. The Nung, Tay, Thai and Muong are also well represented among migrants in the survey, while the Hmong, Dao and Khmer and under-represented relative to their population shares.

Ethnic Group	Number of Migrants	%
Kinh	9,013	90.1%
Nung	239	2.4%
Tay	219	2.2%
Thai	115	1.1%
Muong	85	0.8%
Hmong	65	0.6%
Dao	63	0.6%
Ноа	59	0.6%
Khmer	17	0.2%
Others	132	1.3%
Total	10,007	100

# Table 6: Migration and Ethnicity, 2004

*Source: Own calculations based on Vietnam Migration Survey 2004 (GSO, 2005)* 

Although, it does not record the ethnicity of migrants, the 2006 Population Change, Labour Force and Family Planning Survey (GSO, 2007) shows in-migration is most important in the Southeast followed by the Central Highlands. Out-migration rates are lowest from the Northwest and are also relatively low for the Northeast. In terms of the number of migrants, the Mekong River Delta is the largest sources of out-migrants.

Analysis of income data from the VHLSS06 confirms that the ethnic minorities in rural areas derive a much less of their income from wage labour than the minorities.<sup>1</sup> Indeed, as Figure 11 shows while the amount of income the minorities derived from agriculture (crops, forestry and fisheries) is only slightly lower than the Kinh and Hoa, their incomes from other sources are much lower. The minimal amount which the ethnic minorities typically derive from non-farm enterprises is particularly striking. As explained in the next section, the proportion of crop income which the minorities derive from non-staple crops is also low. This is reaffirmed by Pham *et al.* (2008) using the data from the Programme 135 – Phase II (P135-II) baseline survey. They report that ethnic minority-headed households living in 400 of Vietnam's poorest communes are more dependent on agricultural sources of income, which accounted for nearly 70% of their total average income, while wage income accounted for 18%. In contrast, Kinh and Hoa households in the P135 baseline survey earned nearly half of their income from non-farm activities, while agriculture contributed less than 40% and wage income nearly a third of average Kinh-Hoa households' incomes.



#### Figure 11: Income Sources by Ethnicity, Rural Areas 2006

Source: Own calculations based on VHLSS06

#### Public Services and Social Transfers

To conclude this section, we examine the extent to which the ethnic minorities benefit from the provision of public services and transfers. Table 7 show the percentage of households in rural areas who have access to safe drinking water, main electricity and preferential loans.<sup>2</sup> Access to safe drinking water has expanded dramatically in rural areas since 1998, especially for the minorities. However, less than two-fifths of the Other Northern Upland and Other

<sup>1.</sup> We are grateful to Nguyen Bui Linh for sharing these income aggregates with us.

<sup>2.</sup> Access to public facilities, such as schools, hospitals and roads, is considered in Section 2.4.

minority categories had access to safe drinking water in 2006. Access to main electricity, which in 1998 was already high by developing country standards, has also improved substantially. By 2006, 94% of all rural households had access to mains electricity, with all ethnic categories except the Other Northern Upland Minorities having coverage rates of more than 75%. In both these cases, the impact of government infrastructure programs in mountainous and remote communes can be seen. Access to preferential (subsidised) loans has, under pressure to reform Vietnam's banking system, declined by almost a half. The minorities have, however, been less severely affect by the contraction of preferential loans than the Kinh and Hoa.

	Safe drinking water (% of households)		Mains Electricity (% of households)		<b>Preferential loans</b> (% of households)	
	1998	2006	1998	2006	1998	2006
Kinh and Hoa	32.9	88.4	75.7	97.3	10.0	5.0
Minorities	11.6	55.6	47.0	79.7	17.0	15.4
Khmer and Cham	57.1	90.1	24.6	82.7	4.3	5.3
Tay-Thai-Muong-Nung	5.1	57.6	56.3	82.4	20.5	16.9
Other Northern Uplands	3.0	35.5	63.1	55.6	13.6	14.6
Central Highlands	2.4	50.8	25.3	92.9	18.5	17.6
Others	7.6	40.2	30.2	77.4	19.9	16.4
Rural average	29.1	82.8	70.5	94.3	11.3	6.8

## Table 7: Access to Public Services in Rural Areas

Notes: Safe water includes water from taps and drilled wells, rain water, protected fountain water, bottled water ,and tank water. Preferential loans are loans from the Bank for Social Policy, Program 143, and the Employment Fund.

Source: Own calculations based on VLSS98 and VHLSS06

In recent years, a discussion has also emerged about whether some ethnic minority groups are becoming dependent on social transfers and other supports. As can be seen from Table 8, social protection support payments in rural areas have more than doubled between 1998 and 2006, with Kinh and Hoa households receiving more than all other groups (with the possible exception of the residual others category in 2006, which contains just 28 households). The relatively prosperous and well integrated Tay-Thai-Muong-Nung category have also done well from social protection transfers, with the support payments they receive almost tripling to almost 1 million per person per annum over this period.. Social protection payments to the Central Highland rose even faster over this period, with the Central Highland Minorities overtaking Northern Upland Minorities are the third largest beneficiary of social protection transfers. The remaining columns of Table 8 show the percentage of households receiving different types of social assistance or insurance payments. In 1998, the percentage of households receiving social supports was much

higher among the Kinh and Hoa than for the minorities, with the exception of preferential loans. In contrast, by 2006, a higher percentage of the ethnic minority households were receiving social transfers for all categories except social insurance. For some categories, such as education and health assistance the improvement is very large indeed. Furthermore, the poorest ethnic minority categories (such as the Other Northern Uplands and Central Highland Minorities) are now more likely to receive these transfers. While such figures could be interpreted as evidence of increasing dependence among the ethnic minorities, they also provide evidence of improvements in the poverty targeting of social transfer payment to the poorest rural groups.

	Social Protection Transfers (000s VNDs)	Health assistance	Social assistance (A)	Social insurance (B)	Social protection payments (A+B)
1998					
Kinh and Hoa	485	18.3	10.6	9.8	18.8
Ethnic minorities	284	13.0	7.8	6.6	13.8
of which :					
Khmer and Cham	20	3.7	2.5	0.2	2.7
Tay-Thai-Muong-Nung	396	14.8	5.8	10.6	15.6
Other Uplands	399	3.5	10.7	4.7	14.3
Central Highlands	98	21.0	9.5	2.8	11.8
Others	67	23.6	31.0	0.0	31.0
Rural average	449	17.3	10.1	9.2	17.9
2006					
Kinh and Hoa	1,152	10.3	11.2	6.0	16.0
Ethnic minorities	804	31.5	15.4	3.8	18.5
of which :					
Khmer and Cham	272	24.3	4.8	0.0	4.8
Tay-Thai-Muong-Nung	995	25.0	11.3	5.7	16.3
Other Uplands	518	38.0	15.7	2.6	18.1
Central Highlands	542	46.1	29.2	1.2	29.6
Others	1,649	47.6	40.4	6.3	40.4
Rural average	1095	14.0	11.9	5.6	16.5

## Table 8: Percentage of Households Receiving Social Assistance Payment

Source: Own calculations based on VLSS98 and VHLSS06

Appendix Table 5 provides additional information on the percentage of beneficiary households' real expenditures which are accounted for by different categories of social transfer, of which social insurance payments are clearly the most important. The value of social assistance payments have, however, also increased more than three times between 1998 and 2006, with Kinh-Hoa beneficiaries receiving slightly higher payments than minority beneficiaries (in both absolute and percentage terms).

Having set-out this picture of ethnic minority poverty, we now move to assessing how much of the observed disparities in majority-minority living standards can be explained by differences in their household and community characteristics, and how much to difference in the returns they receive for these characteristics.

# 3. Decomposing the Ethnic Gap, 1998-2006

Following the approach in the existing literature, we use per capita expenditure as the metric to examine the gap in welfare between the majority and ethnic minorities in rural Vietnam (see Van de Walle and Gunewardena, 2001; Baulch *et al.*, 2008). Our chosen measure is defined as real household per capita expenditure computed on the basis of total household food and non-food consumption over the past 12 months. We restrict our sample to rural areas both because this is where the vast majority of Vietnam's ethnic minorities live, and because of well-known problems with the urban sampling frame for the 1998 and 2004 surveys (Pincus and Sender, 2006; VASS, 2006). Following Van de Walle and Gunewardena, (2001) and Baulch *et al.* (2008) we treat households headed by either Kinh or Hoa as comprising the majority group, and households headed by the other 52 official recognized ethnic groups as a broadly defined minority group.<sup>1</sup> Note that it is econometrically problematic to disaggregate the minorities further in a multiple regression context, because of sample size issues. Approximately, 14% of households were headed by ethnic minorities in 1998, rising slightly to around 15% by 2006.



## Figure 12: Evolution of the Rural Ethnic Expenditure Gap

Source: Own calculations based on VLSS98 and VHLSSs 2002-2006

<sup>1.</sup> The motivation for merging the Hoa (Chinese) with the Kinh to form the majority group relates to the fact that Hoa headed households are widely recognized as being relatively well-off and economically integrated in Vietnam, though this phenomenon is strongest in urban areas.

The welfare gap between the Kinh and Hoa and the ethnic minorites can be highlighted by plotting the kernel densities for per capita household expenditure between 1993 and 2006 in Section 1 (see Figure 2). The average per capita expenditures of Kinh-Hoa per household was 51% higher than that of the minorities in 1998, and increased to 74% by 2006. The largest part of the increase occurred between 1998 and 2004. Figure 12 plots the actual household expenditure gap between the Kinh-Hoa and the minority groups by percentile ranking. It is evident that the gaps in household living standards have widened considerably over time at almost all the non-extreme percentiles of the distribution and these gaps exhibit a degree of stability across most of the expenditure distribution.

Given the growing gap in real per capita expenditure between the Kinh-Hoa and ethnic minority groups, the subsequent sub-section describes the methodologies employed to decompose that ethnic expenditure gap. The empirical results will be analyzed in the third sub-section, where a focus is placed on findings ways to explain the reasons underlying why ethnic minorities tend to 'receive' less from their endowments compared to their Kinh and Hoa counterparts.

#### **Empirical Methodology**

We define the ethnic-specific expenditure equations for the majority and minority groups by:

$$\boldsymbol{y}_m = \boldsymbol{x}_m' \boldsymbol{\beta}_m + \boldsymbol{\mu}_m \tag{1}$$

$$\boldsymbol{y}_{e} = \boldsymbol{x}_{e} \,^{\prime} \boldsymbol{\beta}_{e} + \boldsymbol{\mu}_{e} \tag{2}$$

where *j* is the ethnic group subscript (j = m and *e* that denote the majority and minority groups respectively);  $y_j$  is the natural logarithm of per capita expenditures for the group *j*;  $x_j$  is a ( $k \times n$ ) matrix of household characteristics (e.g., household structure, education of members, household landholding) and community characteristics (e.g. infrastructure conditions);  $\beta$  is a ( $k \times 1$ ) vector of unknown parameters capturing the effect of various covariates on the natural log per capita expenditure ( $y_j$ );  $\mu$  is a ( $n \times 1$ ) vector of random error terms.

Applying the Blinder-Oaxaca decomposition (Blinder, 1973; Oaxaca, 1973), the estimated mean ethnic difference in log PCE is generally expressed as:

$$\bar{\boldsymbol{y}}_{m} - \bar{\boldsymbol{y}}_{e} = (\bar{\boldsymbol{x}}_{m} - \bar{\boldsymbol{x}}_{e})' \hat{\boldsymbol{\beta}}_{m} + \bar{\boldsymbol{x}}_{e}' (\hat{\boldsymbol{\beta}}_{m} - \hat{\boldsymbol{\beta}}_{e})$$
(3)

where the 'bar' denotes mean values and the 'hat' denotes coefficient estimates. This allows the overall average differential in per capita expenditure between the two ethnic groups to be decomposed into a part attributable to differences in characteristics (also known as the 'explained' or 'endowment' effect) and a part attributable to differences in the estimated returns to characteristics between majority and minority workers (also known as the 'unexplained', 'treatment' or 'residual' effect). The second term in equation (3) is sometimes taken to capture the effect of 'unequal treatment' against ethnic minorities although, as explained in Section 2.4 below, this interpretation must be treated with caution. This approach assumes that in the absence of 'unequal treatment' the majority group's coefficient structure prevails.<sup>1</sup> Given that these components are (log) linear in the estimated parameters, their sampling variances can be computed with ease. In addition, the overall treatment and endowment components can be decomposed further into sets of characteristics and coefficient differences, to identify the key factors driving the overall components. In the current study, the variables are classified according to household structure (e.g., household size, age structure composition of the household), household education levels, landholding characteristics (e.g., household's access to different types of lands), and commune characteristics (such as access to electricity, markets, post-offices, post-offices, roads, schools and the geographic region the commune is located in).

Blinder-Oaxaca type decomposition are cast within a mean regression framework, which provides an incomplete picture of the ethnic expenditure gap. So we also estimate a set of conditional quantile regressions which allows for a more detailed analysis of the relationship between the conditional per capita expenditure distribution and selected covariates. It is well known that, in contrast to the OLS approach, quantile regressions are less sensitive to outliers or heteroskedasticity, and also provides a more robust estimator in the face of departures from normality (Deaton, 1997; Koenker, 2005).

Using quantile regressions, log per capita household expenditure equations can be estimated conditional on a given specification for various percentiles of the residuals (e.g., 10th, 25th, 50th 75th or 90th) by minimizing the sum of absolute deviations of the residuals from the conditional specification (see Chamberlain (1994)). It should be stressed that the precision of the parameter estimates in a quantile regression model is dependent on the density of points at each quantile. Specifically, the quantile regression coefficients may be more difficult to compute and the corresponding test statistics may have less statistical power at quantiles located at the bottom or the top ends of the conditional distribution, where the density of data points tend to be relatively thin.<sup>2</sup> Thus coefficient for the minority group's at the more extreme quantiles should be treated with due caution.

In the current case, the quantile regression for the majority and minority sub-samples can be defined as:

$$y_{m} = x_{m}' \beta_{\theta m} + \mu_{\theta m}$$
(4)  
$$y_{e} = x_{e}' \beta_{\theta e} + \mu_{\theta e}$$
(5)

IIf  $Q_{\theta}(.)$  is taken to denote the conditional  $\theta^{th}$  quantile operator, then  $Q_{\theta}(\boldsymbol{w}_{j}|\boldsymbol{x}_{j}) = \boldsymbol{x}_{j} \boldsymbol{\beta}_{\theta j}$ , where  $\boldsymbol{\beta}_{\theta j}$  is the unknown parameter vector for the  $\theta^{th}$  quantile with  $\theta$  representing the selected quantile of interest (i.e., 0.1, 0.25, 0.5, 0.75 and 0.9 in the current application);  $\mu_{\theta j}$  denotes the error term, the distribution of which is left unspecified but for which  $Q_{\theta}(\mu_{\theta j}|\boldsymbol{x}_{j}) = 0$  is assumed; and *j* is the subscript for the ethnic groups (*j* = *m*, *e*).

<sup>1.</sup> The minority coefficient structure could be also assumed to prevail in the absence of unequal treatment. This can yield numerically different values for the component parts compared to expression [3] due to a conventional index-number problem.

<sup>2.</sup> Accordingly the sampling variances for the quantile regression coefficients are obtained using a bootstrapping procedure with 200 replications.

From equations (4) and (5) the conditional  $\theta^{th}$  quantile of the distribution of PCE for the two groups are then expressed as:

$$Q_{\theta}(\boldsymbol{y}_{m}) = E(\boldsymbol{x}_{m}|\boldsymbol{y}_{m} = Q_{\theta}(\boldsymbol{y}_{m}))'\boldsymbol{\beta}_{\theta m} + E(\boldsymbol{\mu}_{\theta m}|\boldsymbol{y}_{m} = Q_{\theta}(\boldsymbol{y}_{m}))$$
(6)

$$Q_{\theta}(\boldsymbol{y}_{e}) = E(\boldsymbol{x}_{e}|\boldsymbol{y}_{e} = Q_{\theta}(\boldsymbol{y}_{e}))'\hat{\boldsymbol{\beta}}_{\theta e} + E(\boldsymbol{\mu}_{\theta e}|\boldsymbol{y}_{e} = Q_{\theta}(\boldsymbol{y}_{e}))$$
(7)

where the 'hats' now denote quantile regression estimates and  $E(\times)$  is the expectations operator. In the expressions (6) and (7), the characteristics are evaluated conditionally at the unconditional quantile per capita expenditure value and not unconditionally as in the case of the mean regression. The terms  $E(\mu_{\theta j}|\boldsymbol{w}_j = Q_{\theta}(\boldsymbol{w}_j))$  are thus non-zero. From (6) and (7), the gap in per capita expenditure between the majority and minority groups at the  $\theta^{th}$  quantile is defined as  $\Delta_{\theta}$  and this can be decomposed into three parts:

$$\Delta_{\theta} = \Delta \Omega_{\theta}' \hat{\beta}_{\theta m} + \Omega_{\theta e}' \Delta \hat{\beta}_{\theta} + \Delta R_{\theta}$$
(8)

where 
$$\Delta \hat{\boldsymbol{\beta}}_{\theta} = (\hat{\boldsymbol{\beta}}_{\theta m} - \hat{\boldsymbol{\beta}}_{\theta e})$$
 and  $\Delta \boldsymbol{\Omega}_{\theta} = \boldsymbol{\Omega}_{\theta m} - \boldsymbol{\Omega}_{\theta e}$   
with  $\boldsymbol{\Omega}_{\theta m} = E(\boldsymbol{x}_{m} | \boldsymbol{w}_{m} = Q_{\theta}(\boldsymbol{w}_{m}))$  and  $\boldsymbol{\Omega}_{\theta e} = E(\boldsymbol{x}_{e} | \boldsymbol{w}_{e} = Q_{\theta}(\boldsymbol{w}_{e}))$   
and  $\Delta \boldsymbol{R}_{\theta} = [E(\boldsymbol{\mu}_{\theta m} | \boldsymbol{w}_{m} = Q_{\theta}(\boldsymbol{w}_{m})) - E(\boldsymbol{\mu}_{\theta e} | \boldsymbol{w}_{e} = Q_{\theta}(\boldsymbol{w}_{e}))]$ 

The first and second expressions on the right hand side of equation (8) are the quantile analogues to the differences in characteristics and differences in returns components of the conventional Blinder-Oaxaca decomposition.

Using mean characteristics in the computation of expressions [8] may provide unrepresentative realizations for the characteristics at points other than the unconditional mean to which they relate. Therefore, it is necessary to compute realizations of the characteristics that more accurately reflect the relevant points on the conditional household expenditure distribution. In order to address this issue, we use an approach originally suggested by Machado and Mata (2005) to derive the realizations for the relevant characteristics at different quantiles of the conditional household expenditure distribution. The procedure involves drawing 100 observations at random and with replacement from each of the majority and minority sub-samples. Each observation once ranked comprises a percentile point on the log per capita household expenditure distribution. The full set of characteristics for the observation at the q<sup>th</sup> expenditure quantile is then retrieved. This process is then replicated 500 times to obtain 500 observations at the selected q<sup>th</sup> quantile. The mean characteristics of these observations at each quantile are then used to construct the realizations for  $\Omega_{_{\theta m}}$  and  $\Omega_{_{\theta e}}$  used in equation [8]. Finally, the sampling variances for the constituent parts of [8] are computed in using the regression models' bootstrapped variance-covariance matrices.

#### **Empirical Results**

The mean and quantile regression estimates for the two ethnic groups using both mean regression and quantile regression approaches are reported in Table A1 of the Appendix.

The set of regressors covers household structure (household size, age structure composition of the household), household education levels, landholding characteristics (households' access to different types of lands), and commune characteristics (such as access to electricity, markets, post-offices, roads, schools and the geographic region the commune is located in). These estimates are not the subject of discussion here to conserve space. However, the estimates are generally signed in accordance with priors and have plausible magnitudes. The 'goodness-of-fit' measures are satisfactory by cross-sectional standards, for both mean and quantile regression, which is an important requirement given the decomposition analysis undertaken in this study.

We now turn attention to the decomposition analysis contained in Table 9. The estimates reported in this table use the Blinder-Oaxaca decomposition of equation [3], assuming the majority coefficient structure prevails. The raw mean ethnic gap in per capita expenditures has risen by 15.4 percent between 1998 and 2008, and this increase is statistically significant (the absolute t-ratio corresponding to this point estimate is 2.3). Most of this increased occurred between 1998 and 2004, during which time the ethnic gap increased by 12 percent (0.113 log points). This is in broad agreement with the findings for the existing literature on the widening ethnic gap in Vietnam (see Van de Walle and Gunewardena, 2001; Baulch *et al.* 2004, Hoang *et al.* 2007, Baulch *et al.* 2008).

Using the framework in [3] with the mean regression approach, such widening gap is decomposed into 'differences in characteristics' (i.e. household and community characteristics) and 'differences in returns' to those characteristics. As ethnic minorities are not as well endowed with community, educational or physical assets as their majority counterparts, their welfare status is lower than that of the majority. Our decomposition results (Table 9) reveal that these 'differences in characteristics' account from one third to almost a half of the total ethnic gap. In attempt to further decompose the 'differences in characteristics', we disaggregated this component into sub-groups. The differentials in household demographic structure, education levels and commune characteristics account, broadly in an equal share, for the overall endowment effect. However, differential. The negative sign on the landholding terms in these mean decompositions probably reflects the greater experience and knowledge that ethnic minority peoples have in farming upland areas.<sup>1</sup>

Interestingly, the contribution of these differences in characteristics tends to increase over time. The differences in characteristics between the majority and ethnic minority accounted for 39% of the total ethnic gap in 1998, while these contributed up to 48% in 2006. This increase is statistically significant at 10% level (i.e. t-ratio is 1.6537). So our findings suggest that the endowment gap is high and accounts for an increasing part of the majority-minority expenditure gap.

<sup>1.</sup> This is consistent with Engvall's (2006) findings for ethnic minorities in Lao PDR.

# Table 9: Decomposition of the Ethnic Gap in Household Expenditures at the Mean,1998-2006

	1998	2004	2006
Total differential	0.4112***	0.5241***	0.5540***
	(0.029)	(0.016)	(0.054)
Due to differences in	0.1585***	0.187***	0.2650***
Characteristics	(0.035)	(0.023)	(0.054)
Of Which:			
– Household structure	0.0671***	0.1029***	0.0925***
	(0.005)	(0.007)	(0.007)
– Education	0.072***	0.0762***	0.0758***
	(0.006)	(0.004)	(0.004)
– Landholding	-0.0398***	-0.034***	-0.0184*
	(0.011)	(0.008)	(0.011)
- Commune or district effects	0.0592*	0.0419*	0.1152***
	(0.032)	(0.024)	(0.024)
Of Which:			
Due to differences due in returns	0.2527***	0.3371***	0.2890***
	(0.045)	(0.028)	(0.029)

Notes:

(a) The decomposition in this table uses the set of majority coefficients as the reference group for unequal treatment; see expression [3].

(b) Standard errors are reported in parentheses. The effects of clustering and stratification are taken into account in the computation of these standard errors.

(c) \*\*\*, \*\*, and \* denotes statistically significant at the 0.01, 0.05 and 0.1 levels respectively;

Sources: Own calculation based on VLSS98, VHLSS04 and VHLSS06

More than half of the total majority-minority gap in per capita expenditure is attributed to 'differences in returns' (to the above characteristics). This means that returns to these characteristics are lower for the ethnic minority than for the Kinh-Hoa. There are several ways to explain these differences in returns. Unobserved factors, such as differences quality of education, the quality and cost of infrastructure facilities or public services, provide one explanation for these differences. If there were better information on the quality of education or infrastructure, these differences would be reflected by the coefficients 'differences in characteristics'. But in practice, many features of quality are unobserved, so the difference in returns will include some differences due to these unobserved factors. Another way to explain these 'difference in return', is as evidence of disadvantages facing the minorities. Section 2.4 will explore the reasons underlying the 'differences in returns' in details.

We now turn to a discussion of decomposition of the ethnic expenditure gap computed at selected points of the conditional log per capita expenditure distribution using expression [8]. The estimates for this exercise are reported for the three separate years in Table 10. The results at the median (50<sup>th</sup> percentile) show considerable differences compared to those at mean in Table 9. This suggests the influence of extreme observations on decomposition based on the mean regressions and lends a further justification for the use of quantile regression approach in Table 10.

For all years, the point estimates for the raw ethnic expenditure gap an increase between the 10<sup>th</sup> and 90<sup>th</sup> percentiles, though the evolution of the increase is not monotonic in any of the three years. The portion of the overall gap accounted for by endowment differences is also fairly stable across the selected percentiles and, as with the mean regression analysis, comprises between one-third to a half of the relevant total raw gap in each of the three years. This implies that at least a half of the total gap in per capita expenditure between the majority and ethnic minority groups is explained by 'differences in returns'. In this regard, our results are consistent with those reported earlier by Baulch *et al.* (2008).

	10th	25th	50th	75th	90th
1998					
Total differential	0.4049***	0.4773***	0.4084***	0.5367***	0.6151***
	(0.031)	(0.024)	(0.024)	(0.026)	(0.043)
Due to differences in characteristics	0.1713***	0.1991***	0.1807***	0.1909***	0.2152***
	(0.025)	(0.028)	(0.029)	(0.029)	(0.063)
Due to differences in returns	0.2336***	0.2782***	0.2277***	0.3458***	0.3998***
	(0.037)	(0.035)	(0.041)	(0.037)	(0.08)
2004					
Total differential	0.482***	0.5865***	0.5941***	0.5524***	0.5485***
	(0.024)	(0.019)	(0.022)	(0.026)	(0.024)
Due to differences in characteristics	0.207***	0.2438***	0.2471***	0.1973***	0.200***
	(0.026)	(0.027)	(0.024)	(0.027)	(0.039)
Due to differences in returns	0.275***	0.3427***	0.347***	0.3551***	0.3485***
	(0.038)	(0.033)	(0.032)	(0.033)	(0.047)
2006					
Total differential	0.5084***	0.5727***	0.5049***	0.5817***	0.6076***
	(0.056)	(0.038)	(0.037)	(0.046)	(0.059)
Due to differences in characteristics	0.2583***	0.2491***	0.1699***	0.2129***	0.2763***
	(0.037)	(0.023)	(0.021)	(0.028)	(0.037)
Due to differences in returns	0.2502***	0.3236***	0.3349***	0.3688***	0.3313***
	(0.043)	(0.031)	(0.03)	(0.036)	(0.046)

# Table 10: Decomposition of the Ethnic Gaps in Per Capita Expenditure at Quantiles, 1998-2006

Notes:

(*a*) *The decomposition in this table uses the set of majority coefficients as the reference group for unequal treatment; see expression* [8].

*(b) The log per capita expenditure is regressed on a set of household characteristics and a set of commune characteristics;* 

(c) \*\*\*, \*\*, and \* denotes statistically significant at the 0.01, 0.05 and 0.1 levels respectively;

(*d*) Standard errors are reported in parentheses and are based on bootstrapping with 200 replications.

Source: Own calculation based on VLSS98, VHLSS04 and VHLSS06

Given the significant of 'differences in returns' in explaining the gap between the majority and the broadly defined ethnic minority group, there has been lack of understanding in the current literature on the reasons underlying these differences. Previous studies (as above) have attributed this 'differences in returns' component to either unobserved factors or disadvantages facing the ethnic minorities in Vietnam. However, the evidence for this remains inconclusive. In order to shed light on such 'differences in returns', this paper will use other data sources to examine the drivers of returns in a more explicit, and hopefully more satisfactory, manner.

# 4. The Drivers of Differences in Returns

As discussed in section 2.3, Oaxaca-Blinder decomposition results show that at least a half of the majority-minority gap in per capita expenditure can be attributed to differences in returns characteristics. This results need to be interpreted with some caution because the difference in returns component of the decomposition includes not only the coefficients of the explanatory variables themselves but also the intercepts, which capture unobserved factors. Candidates for these unobservable factors are very broad, ranging from the quality of endowments such as land, education and infrastructure to more subtle factors such as language, customs and practices, and even governance. Ideally, it would be best to carry out quantitative and qualitative analysis simultaneously in all the VHLSS sites but it is too hard and costly to do so in a large scale. Therefore, our explanation of the 'differences in returns' underlying the ethnic gap is based on the combination of results from both household data analysis and a host of PPA and anthropological researches on ethnic issues in Vietnam, summarized in the World Bank (2009) and VASS (2009). In addition, the Baseline Survey of Program 135 Phase 2 (P135-II) that was implemented in 400 of the poorest communes will also be used in places.

## Language and Cultural Issues

When seeking for an explanation on what drives the above 'differences in returns', one obvious possibility is the ability of ethnic minorities to speak the Vietnamese language. Inability to speak Vietnamese language and some traditional cultural practices are emphasized as obstacles that prevent ethnic minorities from being better integrated into the economy and taking advantage of the new opportunities provided by the *Doi moi* in numerous qualitative studies. For example, VASS (2009) found that language constraints under-lied difficulties of ethnic people in accessing services and information. According to World Bank (2009), ethnic women were often reported as being reluctant to use free services due to language and cultural barriers.

Language, however, is not the only barrier to prevent the ethnic minorities from benefiting the mainstream economic development but also other socio-cultural factors. As discussed in World Bank (2009), these may include factors such as "community levelling mechanisms that create social pressure against excess economic accumulation and cultural perceptions of social obligations and "shared poverty"; religious obligations that require economic expenditures; gender expectation grounded in different cultural models; and community ownership of land and assets". Minorities are also reported as not being able to do many economic transactions as the Kinh such as charging interest on loans and selling things to neighbours and kin. These are regarded as against the minorities' social norms. In attempt to capture partially the impact of ability to speak Vietnamese and some cultural factors on welfare status of ethnic minorities, we estimated a simple regression in which the per capita expenditures of ethnic minority-headed households were regressed on the set of the explanatory variables as used in the equation [3], augmented by matrilineal practice, religion, Vietnamese language ability.<sup>1</sup> The results show that ability to speak Vietnamese is an important determinant of welfare for ethnic minority households. For instance in 1998, coming from an ethnic minority-headed household whose head was unable to speak Vietnamese language decreases real per capita expenditures by nearly 10 percent. The association of Vietnamese language ability and expenditures is similar in 2004 and 2006. *Ceteris paribus*, a head's inability to speak Vietnamese is associated with a 10 to 12 percentage point reduction in the level of per capita expenditure for ethnic minority-headed households.<sup>2</sup> This finding is consistent with empirical results in the literature. For instance, Grafton, Kompas and Owen (2007) shows linguistic barriers to communications reduce productivity and capital accumulation.

## Returns to Land and Land Quality

Ethnic minorities possess more land than the Kinh and Hoa and their land holdings have tended to increase over time. However, the ethnic groups' land bundle consists mostly of forest land and low quality, unirrigated annual crop land while the Kinh-Hoa have much more water surface land and their crop land is usually irrigated and of higher quality (Table 11). In 2004 and 2006, while more than 80 percent of the annual cropland of the Kinh and Hoa was irrigated, only 44 percent of ethnic minority land was irrigated. At the start of the land reform in 1993, the average ethnic minority-headed household possessed 63 percent more land (of all types) compared to that of the Kinh-Hoa headed household. After fourteen years, this advantage increased to 154 percent. This advantage is most pronounced for forestry land. On average, ethnic minority-headed households possess 10 times more forestry land than majority-headed households.

<sup>1.</sup> These variables are only collected in some rounds of the VLSSs and VHLSSs, and so could not have been included as explanatory variables in the mean and quantile regressions underlying their decomposition analysis.

<sup>2.</sup> Note that these regression results did not find any evidence that matrilineal practices or religion are statistically significant determinants of the per capita expenditures of the ethnic minorities.

Annual crop		Demonstal Foresterr		TAT: 4		
_	Irrigated	Non-irrigated	Perennial	Forestry	Watersurface	Others
1993						
Rural average	2040.51	2407.56	710.07	174.75	102.54	271.88
Kinh and Hoa	2232.32	1973.53	669.34	70.87	109.78	174.87
Ethnic minorities	942.55	4891.98	956.2	802.61	58.79	858.23
1998						
Rural average	2772.53	1109.21	1197.04	1005.89	1026.44	1769.77
Kinh and Hoa	2831.35	918.91	1148.55	422.85	1205.84	1269.54
Ethnic minorities	2461.23	2116.39	1453.68	4091.7	76.96	4417.28
2004						
Rural average	2920.11	1071.3	1034.78	1072.08	306.45	527.45
Kinh and Hoa	2883.71	584.24	940.76	496.87	336.92	481.36
Ethnic minorities	3133.38	3924.61	1649.59	4833.49	107.25	828.79
2006						
Rural average	2998.05	1117.23	1215.63	1207.33	287.01	364.16
Kinh and Hoa	2963.4	545.6	1172.25	512.38	315.84	336.18
Ethnic minorities	3182.47	4159.4	1474.95	5361.05	114.66	531.43

## Table 11: Land Endowments of Kinh-Hoa and Ethnic Minorities Households (m2)

Source: Own calculations from the VLSS 1993, 1998, and VHLSS 2004, 2006

Although the ethnic minorities possess more land than the majority and achieve higher returns to their land compared to their Kinh-Hoa counterparts, there are many factors that place them at their disadvantage in making use of their land endowments. First, their knowledge about their rights over land is less than the Kinh-Hoa. Historically, the ethnic minorities used to live in land tenure systems in which community-managed land was not commoditized (Vuong, 2001). The land reforms in Vietnam, which aims at allocating land to households, have proved to be a big success for Vietnam's development and poverty reduction (Ravallion and van de Walle, 2008). Yet, to many ethnic people, understanding and practicing their land rights is still a challenge (VASS, 2009). Not being able to communicate well in Vietnamese is a further barrier to some ethnic people's access to land laws and procedures.

Second, ethnic customs and conventions restrain some ethnic people from exercising their rights over land. According to Vuong (2001, p.275), "communal land ownership bears the most characteristic of community-wide participation in land administration of ethnic minorities in the highlands, where land was a common possession; community members had the right to use but not to sell it; land administration was bound with religious beliefs and closely linked with territorial sovereignty and autonomous village governance structures". So, in the transition to a more market-based land tenure system, many ethnic households were unwilling to practice

their private land use rights. Indeed, ethnic households with abundant land have been found to lend it to those with less land for cultivation without any charge (VASS, 2009). Much less forestry land has also been allocated (to predominantly ethnic minority households) than is the case with paddy land. Using data from the National Land Database, Brandt et al. (2006) find that 95% of paddy land had been allocated to households in 2003, compared to just under 25% of forestry land.<sup>1</sup> More recent figure from the Ministry of Agriculture and Rural Development suggests that only 19.1% of all forest land was allocated to households in 2007. Not being able to secure or use their land use rights well has prevented the minorities from using land as collateral, thereby grasping opportunities to move out of agriculture sector or to enhance their productivity and efficiency in agricultural sector.

In spite of higher returns to land which ethnic minority groups achieve in absolute terms<sup>2</sup>, the ethnic minorities live in places where the farm productivity and efficiency is generally lower. At the same time, the agricultural extension services provided to the ethnic minorities are often not appropriate as they are based on wet rice cultivation techniques suitable for the lowlands (Jamieson et al., 1998, Oxfam and Action Aid, 2008; World Bank, 2009). Rice varieties which are more appropriate to the soil conditions in the mountains are often too expensive (VASS, 2009). These call for efficiency-oriented planning and local context-based support from the Government.

Thus given better land quality, the Kinh and Hoa have generally been more successful in translating their land assets into higher returns under Vietnam's new market economy. The Kinh-Hoa have diversified more within the agricultural sector, relying more on industrial and perennial crops and less on low-value staple crops, and have often supplement their farm income with trading or services. The ethnic minorities, on the other hand, tend to be locked in staple and traditional agriculture (World Bank, 2009). Pham et al. (2008) using data from the P135-II Baseline Survey reported that both the Kinh and Hoa-headed and the minority-headed households in P135-II communes allocated about 54% of their land endowments for paddy production. Minority-headed households then used most of the remaining agricultural land for low-productivity food crops, while the Kinh and Hoa-headed households allocated their remaining to industrial crops. So while food crop were the most important source of agricultural income for the ethnic minorities after rice, the Kinh and Hoa households relied on industrial crops to supplement their incomes from rice production.

## Education Quality and the Returns to Education

Quality of education could be an important unobserved factor underlying the aggregate component of 'differences in returns' reported above. However, as noted in Section 1, data on education quality is however rarely available. Furthermore, when assessing the returns to education it is past rather than current educational quality that is important. Our estimates on the determinants of per capita expenditures shows that, after controlling for other household and community characteristics, the returns to education of both the majority and minority groups are positive. Furthermore, they favour the Kinh/Hoa group at all schooling levels

<sup>1.</sup> Some 35% of the remainder was owned by economic organisations (such as State Forest Enterprises) and another 24% by others (which includes the military).

<sup>2.</sup> These higher absolute returns may be explained by the fact that the minorites have little choice but to work hard on their land (van de Walle and Gunewardena, 2001: pp198).

with the exception of primary (see Table A1 in the appendix).<sup>1</sup> These results are similar to those of Baulch *et al.* (2008), who regressed per capita expenditure on a set of explanatory variables, including the educational attainment of the most educated household members for the Kinh-Hoa and the minority groups for the period 1993-2004. Their results also show that returns to education are higher for the Kinh-Hoa households than the ethnic minority-headed households in cases. The same results are also observed in Walle and Gunewardena (2001) for 1993 and Nguyen *et al.* (2009) for 2002, 2004 and 2006. This suggests that a generalized policy of education expansion will not be enough to close the ethnic education gap.

Regarding wage returns to education, the previous literature notes that education is an important factor of the wage determination process in Vietnam (Pham and Reilly, 2009). It is likely that education is more important to wage and salary employees in rural areas than those who are self employed (either in agriculture or in the rural nonfarm sector). However, as highlighted in Section 1, the ethnic minorities are much less likely to be employed as wage workers and are generally less mobile than the Kinh-Hoa. Furthermore, not only is access to wage income is limited for ethnic minorities, but the few ethnic minority workers who are wage employee are subject to lower returns than the Kinh-Hoa counterparts with the same characteristics. Pham and Reilly (2009) examined the ethnic way gap using the data from the VHLSS 2002. After controlling for education, experience and other relevant characteristics, they report that majority workers earn nearly 11 percent more on average than their minority counterparts. Around two-thirds of this earnings differential is attributed to 'differences in returns'. So the returns to educations are lower for ethnic minority than Kinh-Hoa wage workers.

While access to wage income is limited for ethnic minorities, the ethnic minority workers who worked in the market for wage employment are subject to lower returns than the Kinh-Hoa counterparts with the same characteristics. Pham and Reilly (2009) examined the ethnic way gap using the data from the VHLSS 2002. They reported that on average, majority workers earn nearly 11 percent more than their minority counterparts, of which around two-thirds of the earnings differential is attributed to 'differences in returns'. When examining the impact of education on the wage determination process, it was reported that returns to educations are lower for ethnic minority workers than the Kinh-Hoa workers.

### Returns to Infrastructure

Access to infrastructure and services has improved greatly throughout the country, for both the Kinh and Hoa and for the ethnic minorities (Table 12). By 2006, 95 percent of communes had access to mains electricity, compared to 62 percent in 2002. At 100 and 95 percent respectively, figures were much higher among the majority than the minorities group. But the change over time was similar in both cases. The proportions of communes having factories/enterprises located within 10 kilometers also increased slightly for both groups. The distance measured in kilometres from the village has also fallen considerably. For instance, in 2006, the average distance to the nearest hospital was 4.63 km, against 3.68 km for the majority compared to 19.04 and 10.22 km respectively for the year 2002 (Nguyen *et al.* 2009).

<sup>1.</sup> Note that these, and most other studies, estimates of returns to education by ethnicity are very sensitive to commune effects and show strong correlation between education, location and labour market conditions.

	20	02	2006	
	Majority	Minority	Majority	Minority
Proportion (in %) of communes that have				
Factories/enterprises within 10km	71%	33%	74%	40%
Main electricity	98%	62%	100%	95%
Distance (kms) from the village to				
The closest hospital	10.22	19.04	3.68	4.63
Primary school	0.87	1.77	0.73	1.00
Lower secondary school	1.93	3.68	1.44	2.23
Upper secondary school	5.65	11.42	4.98	10.12
Road that cars can travel on	0.81	0.89	0.6	0.81
Public transport	2.96	11.5	1.93	6.16
Post office	2.16	8.62	1.8	4.84

# Table 12: Access to Infrastructure by Ethnicity

Source: Own calculations based on VHLSS02 and VHLSS06

This result is further collaborated by findings in the 2008 PPAs, recording remarkable improvement in the connection of the poor, especially ethnic minorities living in remote communes, to the outside world over the past three to five years. Many roads to remote hamlets, where many ethnic minorities live and which were virtually isolated from the outside world only a few years earlier, have recently been built. The people have been connected both tangibly, through the improved transport system of roads and bridges, and intangibly, through the media and communications systems (such as radio, telephones, television and even the Internet). Improved communications are an important pre-condition to enhancing market access for people living in remote areas. As a consequence of improved communications, commodity exchange and trading has become easier and less costly, which encouraging people in formerly remote communes to expand their production and engage in trade, which raises their incomes. In many areas, the people who used to farm largely for own consumption have now started producing for markets, thereby diversifying and increasing their household incomes (VASS 2009). However, as noted above, the ethnic minorities have tended to focus on lower value staple crops (though some of these, such as maize, are becoming increasing marketised).

Investment in infrastructure does, however, also generate inequalities among some local groups according to the recent PPA results. For instance, most mountainous fields in the research sites of Thuan Hoa, Phan Dien and Binh An cannot be connected to irrigation sources as a consequence of their high elevation. This leads to increasing inequalities among ethnic groups, as most Kinh households farm lower fields, while ethnic minority households farm upland fields. Demand for irrigation works on mountainous fields, which are vital to local farmers, has barely been met (VASS 2009). Furthermore, the new policy of the Government (Decree No. 154/2007/ND-CP issued October 22<sup>nd</sup>, 2007) in providing free irrigation also contributes to

widening the ethnic gap, as this policy works mainly to the advantage of the Kinh farmers who tend to live and engage in irrigated farming in the deltas.

#### Misconceptions of Ethnic Minorities

A final source of the 'differences in returns' is very difficult to quantitatively measure and is a sensitive issue in policy debates in Vietnam. It is quite common for some Kinh people to have misconceptions of the minorities, which might serve to disempower the minorities of their economic rights. Our own observations (based on considerable experience working in the areas of ethnic minority development) suggests that ethnic minorities are frequently considered as less developed than the Kinh. The attention paid to poverty reduction in upland areas by the Government and international donors has served to reinforce the longstanding perception that minorities are economically backward and should be assisted to "catch up" to the Kinh (World Bank, 2009). Given these negative misconceptions, there has been a general tendency to assume that ethnic minority development should involve interventions to eliminate 'backwardness'.

It is not clear, however, how such misconceptions have actually prevented ethnic minorities from taking advantages of opportunities brought by *Doi Moi* in the same way as the Kinh-Hoa majority. Vietnam has laws which prevent discrimination, while Article 5 of the Constitution states that all people regardless of their ethnic origins are considered equal under laws. In addition, there are no cultural codes deeply embedded in society regarding peoples' "status" and "place," as might be the case in societies in which caste is an issue (such as India). These are among most important background for those who believe that discrimination does not exist. However, we argue that the existence of the above misconceptions does represent in one way or the other some harmful impacts on ethnic minorities. For instance, as the 'backwardness' of ethnic minorities are widely recognized, it could effectively decrease participation of ethnic minorities in society.

A recent survey by the Institute of Ethnic Minority Affairs, described by the Country Social Assessment (CSA) of the World Bank (2009) provides evidence of a number of instances of stereotyping of the ethnic minorities. For instance, belief that the minorities have less intellectual capacity can result in investment in Kinh development to "show minorities how to develop", as was the case with migration programs in Quang Tri, rather than directly investing in minority communities themselves. Another example from the CSA where stereotyping occurred was found in the credit system in Dak Lak. There, the Ede reported that the staff of large commercial banks would state (either explicitly or implicitly) that minorities did not have sufficient credit worthiness to obtain large loans, and would therefore direct Ede to the Social Policy Bank. The belief of bankers that minorities couldn't handle larger loans, or the belief among Ede that they would not receive such loans even if they asked, accounts for the fact that many Ede have never taken a large loan out, while many more Kinh have. The existence of such misconceptions and negative stereotyping does represent a source of disadvantages for ethnic minorities. These could be considered as another factor that contributes to the 'differences in returns' component of the ethnic expenditure gap reported in this paper.

# 4. Policies for Ethnic Minority Development

Vietnam has a large number of policies and programs for ethnic minority development. These programs and policies are too numerous and fragmented to describe in detail here, but Appendix Table 7 give details of the objectives, target groups, components and budgets of the

main policies and programs that affect the ethnic minorities. Appendix Table 8 provides further information on the relevant Government decisions, decrees and resolutions governing these policies and programs. As noted by Nguyen and Baulch (2007), Vietnam's policies and programs have targeted ethnic minorities in three ways: based on location, household economic status, and ethnic minority group membership. The first approach, used by Program 135, price and transportation subsidy policies and some components of Program 143, target communes in extremely difficult (Region 3) areas, without distinguishing between the ethnicity of households living in these communes. Regional programs, such as Program 168, 173 and 186, work in the same way though at a more aggregated level, and have proved useful when clear divisions into geographic regions based on different production, settlement and social conditions can be identified. A second approach targets households based on their economic status. For example, the successors to the Program 143 and many education and health exemptions specifically target households that are classified as poor or hungry. Some programs (such as Programs 134 and 139) have added ethnicity as additional criterion for poor households to qualify for benefits and exemptions. A third approach, used by the Program to Support Ethnic Minority Households in Especially Difficult Circumstances and some provincial initiatives, targets specific ethnic minority groups, typically those having very low populations and living standards. Over time, as generalised economic growth raises living standards throughout Vietnam, a shift away from location based targeting, to policies and programs in which the ethnic minorities and other poor groups are specifically targeted appears to be occurring (Nguyen and Baulch, 2007).

In the remainder of this section, we reflect on the policy conclusions which may be drawn from the preceding analysis and make some tentative suggestions for how existing programs and policies for ethnic minority development might be extended, modified or rationalised. We focus first on the broad area of growth and distribution, in particular how the growth process can be made more inclusive for the minorities. Three specific areas in which the ethnic minorities lag the Kinh and Hoa (nutrition, education, and employment) are then discussed. Finally, the role of integrated development programs is briefly discussed.

### Growth and Distribution

As explained in Section 1, while the living standards of the ethnic minorities have clearly improved over the last decade, it is also clear that the minorities have benefited less from the Vietnam's dramatic economic growth than the Kinh and Hoa. In part, this is due to the widening disparities in living standards between the lowlands and uplands as, with the exception of the Khmer and Cham, the ethnic minorities remain overwhelmingly upland residents. However, it would be a mistake to ascribe the poverty of the ethnic minorities entirely to geography (with the policy focus on improving infrastructure and public services in upland areas that this is usually taken to imply). First, the questions of why more ethnic minorities have not migrated to the urban areas (plus nearby industrial zones), along with why the minorities are underrepresented in terms of wage jobs (especially outside the public sector), needs to be addressed. Second, why is it that Kinh and Hoa workers generally earn substantially higher returns to their human and physical capital, while their households enjoy better access to public services, even when they live in the same upland communes as the minorities? In short, how can Vietnam's future growth become more inclusive for the ethnic minorities?

The decomposition analysis conducted in Section 2 shows that ethnic minority households with the same endowments of education, endowments of land, capital and other assets receive

returns that are on average a half to two-thirds lower than Kinh-Hoa people who live in communes with similar characteristics. The magnitude of these differences in returns was also confirmed using quantile regressions. However, with the possible exception of the price and transportation subsidies paid in poor communes, all the ethnic minority policies and programs that Vietnam has adopted focus on improving the endowments of minority households and the communes in which they live (CAF-IDS-DFID-ESRC, 2008; Nguyen and Baulch, 2008). Very few policies or programs address the lower returns to endowments which our empirical analysis shows the ethnic minorities receive.

Some of the measures which we believe could help to rectify this situation include:

- Developing agricultural extension systems and markets that are appropriate to the needs and crops grown by the minorities;<sup>1</sup>

- Making the laws and regulations governing the control and use of forest land more inclusive, while continuing the reform of the State Forest enterprises

- Simplifying the procedures for the minorities to gain commercial loans and (unsubsidised) micro-credit for both agricultural and non-agricultural activities;

- Pro-upland regional (and transportation) policy
- Targeted interventions in education and health (see the following sub-sections)

We now turn to some of more specific policies that could help to counter ethnic minority disadvantage in the nutrition, education and employment sectors.

# Nutrition

The increasing incidence of wasting among children under 24 months of age throughout Vietnam, including in urban areas, since 1998 despite rapid and reasonably broad-based growth is very worrying. The high levels of stunting among children over 24 months, and especially among ethnic minority children, is a further cause for concern. However, contrary to popular perception, under-nutrition is not simply the result of low incomes and inadequate food intake. According to a recent global review the two most important factors in under-nutrition are: (i) inadequate knowledge about the benefits of exclusive breastfeeding, complementary feeding practices and micronutrients; and (ii) the lack of time women have for child care and themselves during pregnancy (World Bank, 2006).

Since the most damaging consequences of under-nutrition occur during pregnancy and the first two years of life, governments with limited resources are best advised to focus their actions on the 'window of opportunity' between conception and 24 months of age (World Bank, 2006). Among the measures which we believe would help to raise the nutritional status of Vietnam's population, especially ethnic minority children are:

• a campaign to promote exclusive breastfeeding of infants under six months old, coupled with the extension of maternity leave for women in wage employment from four to six months

<sup>1.</sup> See Hoang et al. (2006) for a comprehensive diagnosis of ethnic minority and gender issues in agricultural extension in Vietnam.

- the introduction of a comprehensive program for the fortification of basic foods such as cooking oil, flour, fish and soy sauce with Vitamin A, iron, selenium and zinc. The development of new varieties of bio-fortified rice and maize, along perhaps with sweet potato and cassava, could also do much to improve micronutrient intake in Vietnam.<sup>1</sup>
- the provision of free nutritional supplements to women of child bearing age.
- measures to improve sanitation and increase the provision of clean water, especially in remote rural communes and low income urban areas.

The objective of such measures should be to reduce nutritional difference between the majority and minorities groups, while transforming the nutritional status of Vietnam's entire population over the next ten years. The National Nutrition Program in Thailand, which helped to reduce moderate and severe malnutrition there by more than three-quarters in ten years (World Bank, 2006), demonstrates what can be achieved by concerted and coordinated nutrition policies in a single decade.

# Education

As with most issues connected with ethnic minority policy in Vietnam, tackling the problem of the low levels education attained by most ethnic majority children, together with its generally poor quality, requires tackling several interlocking phenomenon.

- To increase and maintain enrolments at the primary school level, in particular the transition from village class rooms to the main commune primary school in mountainous areas, it is clearly to increase the number of school branches and increase the accessibility of the main commune schools (via better intra-commune roads and transportation). In the most remote mountainous areas, the extension and improvement of "community semi-boarding schools" (trường bán trú dân nuôi) along with more flexible age-enrolment criteria, also have their part to play in increasing ethnic minority participation in Grades 3 to 5. Assisting ethnic minority children to be able to learn effectively in Vietnamese is also crucial. While the Government is committed to "create conditions for ethnic people to learn to speak and write in their own language to maintain and develop their ethnic culture, and easily grasp knowledge in the school and other education institutions" (Article 7.2, The Education Law 2005), ethnic children currently have little access to genuinely bilingual education (Kosoenen, 2004; MOET-UNICEF-UNESCO, 2008). Providing instruction in both Vietnamese and ethnic minority languages is particularly important in the first two or three grades of primary school in mountainous areas. The experiences of some international NGOs with child centred methodologies and village classroom assistants (e.g., Oxfam GB in Lao Cai and Tra Vinh, Save the Children UK in Quang Ninh and Dien Bien are well worth reflecting on here.
- To ease the transition of ethnic minority and other poor children from primary to lower and then upper secondary school, multiple measures are also necessary. The recent scholarship programs for disadvantaged ethnic minority children introduced by MOET (with ADB funding) has an important role to play in encouraging children to make the transition and remain in secondary school. For ethnic minority girls,

<sup>1.</sup> See <u>www.harvestplus.org</u>. Unfortunately, Vietnam is not one of Harvest Plus's target countries in Asia.

the importance of personal safety and separate and hygienic sanitation facilities also deserves to be stressed, especially at the boarding school level (MOET-UNICEF-UNESCO, undated). If carefully and appropriately designed, conditional cash transfer programs can be designed these have the potential to provide a major incentive for ethnic minority and other parents to keep their children in school. While the leading examples of the majority of such programs come from Latin America (e.g. *Progressa* and *Oportunidades* in Mexico and the *Bolsa Familia* in Brazil), there are more focused and less complex Asian examples of conditional cash transfer programs that are well worth Vietnam studying.<sup>1</sup>

• So few ethnic minority young people progress to education at the post-secondary level, in particular, to colleges and universities that it is clear that a major initiative is needed here. While the relatively recent abolition of separate streams for Kinh and ethnic minority students in the major colleages and universities is to be welcomed, the role of the three ethnic minority pre-universities, they are still essential to facilitate the transition of ethnic minority students to colleges and universities. It is also clear that the scale of the nomination (*cử tuyển*) system is insufficient to make much of a dent into the dominance of Kinh, and to a lesser extent Hoa and Tay, students at the post-secondary level (Nguyen and Baulch, 2007).<sup>2</sup>

Finally, it is important to remember that one of the major reasons cited for school dropouts throughout Vietnam, but especially in ethnic minority areas, is poverty itself. Faster and more equitably distributed economic growth therefore also has an important role to play in continuing to increase Vietnam's educational standards over the coming years.

## Employment

The quantitative and qualitative data reviewed in Section 1 indicates that ethnic minority are much less likely to be waged or salaried employees than the Kinh-Hoa. Ethnic minority workers also receive lower remuneration and less favourable benefits than Kind and Hoa workers. These trends have been confirmed in a recent decomposition study of wage employment using the VHLSS by Pham and Reilly (2009). As noted in Section 2, lurking behind these statistics and studies, lies the highly contentious issue of whether the ethnic minorities experience "unequal treatment" relative to the Kinh and Hoa? While the case for the existence of 'discrimination' against the ethnic minorities is much less clear than in Latin America and South Asian, the econometric evidence shows consistently and robustly that the ethnic minorities receive lower returns to their education and other assets. We explored the drivers of these differences in returns in Section 2.4, but this analysis raises almost as many questions as it answers. For example, is the reason that the minorities have less access to wage jobs, for example, purely the result of their lower education levels and Vietnamese language skills, and lack of urban networks? Or do other factors such as the schools and colleges they have attended, the types of friends and

<sup>1.</sup> See, in particular, Filmer and Schady (2008) on Cambodia, and Ahmed (2006) on Bangladesh. A recent World Bank Policy Report (Fiszbean and Schady, 2009) provides a broad overview of conditional cash programs throughout the developing world.

<sup>2.</sup> The number of ethnic minority students nominated to colleges and university tripled from 689 in 1998 to 1,709 in 2005 (Bui, 2006). This translates into 40 to 50 higher education places per province a year, although some provincial Departments of Education report being able to nominate almost twice this number of students. However, these places represented just 9.2% of the upper secondary places in boarding system and only 0.65% of the ethnic minority pupils in the upper-secondary schools in 2005.

family contacts they have, or the way they speak Vietnamese also influence their ability to access wage employment? If the latter is the case, then there may be a case for adopting one or more of the policies for enhancing minorities returns that have been adopted in other countries (see Box 1). However, it is also important to note that international experience suggests that the costs of poorly designed or over complex equal opportunity and legislation and affirmative action programs are high (Braunholz-Speight, 2008; Heyer and Jayal, 2009).

On the other hand, if the inability of the minorities to access wage employment is due principally to the quantity and quality of their education, then the measures mentioned above to improve ethnic minority education should receive priority.

Measures to improve the mobility of ethnic minority workers are also important for improving their employment opportunities. As noted by Bryceson et al. (2008) in Vietnam this is now less an issue of improving road access, and more one of improving access and ability to pay for motorised transportation. It is also important to realise that, like improved irrigation and other infrastructure provision, better road access has differential impacts on different population groups, and 'are likely to have the least effects on the poor' (Bryceson et al., 2008, pp. 276). The ethnic minorities lack of contacts and social networks in urban and peri-urban areas, is also likely to detract from their ability to obtain waged employment. Finally, it is possible that some ethnic minorities groups are poorly informed about the recent reforms to the household registration (*ho khau*) system, and this lack of knowledge is restricted their geographic mobility. Such information is likely to be strongly associated with lack of proficiency in the Vietnamese language.

In all events, it is important to realise that attaining employment parity for the minorities requires multiple barrier to be overcome and is likely to take a substantial time to achieve.

# Box 1. Policies to Enhance Ethnic Minority Employment

Internationally, two broad sets of policies have been used to promote greater wage employment and economic integration of ethnic minority (or indigenous) groups. These are:

- Equal Opportunity Legislation, which aims to prevent people with equivalent qualifications and experience from receiving lower wages, less access to jobs or government services on grounds of their ethnicity or gender, religion or sexual orientation. Following the 1959 revolution in Cuba, for example, equal opportunity legislation was enacted alongside broader economic and social policies, which had virtually eliminated the black-white gap in living standards by the 1980s. More recently, Ecuador's 1998 constitution has guaranteed indigenous people communal land rights, the right to education in indigenous languages, and to participate in natural resource use decisions. Despite the prevalence of equal opportunity legislation in these and other developing and industrialised countries, numerous studies show that gaps in wages and living standards are still prevalent.
- <u>Affirmative Action programs</u>, which give preferential treatment to members of disadvantaged groups. For example in India, since 1950 a percentage of higher education places, government jobs and some parliamentary seats are reserved for members of the scheduled castes and tribes. Similarly, Malaysia's New Economic Policy of 1971 set targets for native Malay or *bumiputera* employment in different sector together with (joint) ownership of companies. Affirmative action programs, which have also been used in South Africa and the United States, are controversial and can be criticised for helping already relatively better-off members of ethnic groups, generating resentment among other groups, and undermining advancement based purely on merit.

Source: Adapted from Braunholz-Speight (2008) and CAF-IDS (2008)

#### Integrated Rural Development Programs

Given the interlocking nature of the disadvantages which many ethnic minority living in mountainous areas experience, integrated rural development programs (IRDPs) have a natural appeal, especially in rural areas. There have been a number of government and donor sponsored IRDPs (including Programs 168, 173 and 186, the Vietnam Sweden Mountain Rural Development Programme in the 1990s, the Northern Mountains Poverty Reduction Project, ADB projects in Central Vietnam and IFAD projects in Bac Kan, Cao Bang and elsewhere). Program 135 is also been informed by an IDP perspective, although in practice, it was and is still largely focused on improving road access and infrastructure provision within Vietnam's poorest communes. Concerns that are commonly expressed about IRDPs in other countries are that they a complicated to administer, costly and time-intensive thereby posing challenges to the capacity of the decentralised bureaucracies that are usually favoured to implement them (Kumar, 1987). In other countries, bureaucracies have also been successful in capturing large shares of the economic gains generated by IRDPs (Ruttan, 1975). Recent experience in Central Asia, Latin America and the Middle-East suggests that target communities and not just national and regional governments and village leaders must have true ownership over the IRDP process along with the capacity to sustain and managed new infrastructure investments (USAID, 2006). Similarly, within Vietnam, a recent review of the Northern Mountains Poverty Reduction Project found that tailoring public information to individual local circumstances and awareness raising are essential if there is to be effective community participation in these projects (World Bank, 2008). Furthermore, concerns have been expressed regarding program capture by certain less disadvantaged groups. Finally, because they operate in some areas but not others, IDPs may actually increase inequality between different areas and ethnic groups.

For all these reasons, although the both 'joined-up development policies' and improving infrastructure in remote areas are important, we recommend a caution approach to the adoption of IDPs as a 'panacea' for ethnic minority development.

## 5. Some Concluding Remarks

The scale and depth of ethnic minority poverty in Vietnam presents one of the major challenges to Vietnam achieving the targets for poverty reduction set out in the Socio-Economic Development Plan, as well as the Millennium Development Goals. As Section 1 of this paper demonstrates the ethnic minority poverty in Vietnam is multi-dimensional and increases cumulatively with the life course. This is the results of a complex interplay of several overlapping layers of disadvantage which start *in utero* and continue until adult life. Counter-acting such disadvantages requires multiple interventions coordinated across a number of sectors, which pose complex implementation challenges in Vietnam's multi-layered system of government. Nonetheless, we believe that there are certain initiatives in the nutrition and education sectors (e.g., the bio-fortification of staple foods, provision of nutritional supplements to women of child bearing age in mountainous areas, the development of weekly boarding schools, and the extension of simple conditional cash transfer/scholarship programs) that are relatively simple to implement and which would make an important difference to the life chances of ethnic minority children. Counter-acting the disadvantages which ethnic minority people face later in their life, especially improving their rural livelihoods and access to wage employment, is more complex. In the agriculture and forestry sectors, extension systems which are sensitive to the farming systems and tenure practices of the different minorities require development. Improving infrastructure in the remote villages in which the smaller and more disadvantaged ethnic groups live, also has its role to play in improving the returns they receive to their assets. However, given the extensive investments which have been made here in recent years, the importance of further investments in infrastructure should not be overstated. In the wage employment field, further work is needed exploring the extent to which ethnic minority workers experience disadvantages, or whether their clear inability to access wage jobs outside the public sector is a function of their education (combined, perhaps, with 'educational screening'), networks and Vietnamese language ability. Finally, the importance of promoting growth that is geographically broad and socially inclusive is essential. Without a more equitable pattern of growth, the current disparities between the majority Kinh and Hoa and the ethnic minorities are sure to continue growing.

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		Stun	ting	S	Severe s	stunting		Was	ting
	2006	1998	Two sample mean comparison test P-value	2006	1998	Two sample mean comparison test P-value	2006	1998	Two sample mean comparison test P-value
Kinh & Hoa	33%	46%	0.0000	13%	13%	0.0000	12%	12%	0.0000
Khmer & Cham	21%	37%	0.0000	11%	14%	0.0747	7%	13%	0.0004
Tay-Thai-Muong- Nung	45%	40%	0.0000	18%	15%	0.0000	13%	9%	0.0000
Other Northern Uplands	51%	55%	0.3115	32%	26%	0.1047	11%	7%	0.0021
Central Highlands	59%	52%	0.0000	26%	27%	0.7355	16%	14%	0.0000

# Appendix Table 1: Changes in Stunting and Wasting Rates by Ethnic Category, 1998-2006

Sources: Own calculations based on VLSS98 and VHLSS06

			< 24 m	onths					>=24 m	onths		
		<b>NLSS</b>	8		SSIHA	06		6SSJV	8		SSTHA	06
	Boys	Girls	Group mean comparison test P-value	boys	Girls	Group mean comparison test P-value	Boys	Girls	Group mean comparison test P-value	Boys	Girls	Group mean comparison test P-value
Urban												
stunting	22%	19%	0.0029	20%	11%	0.0000	27%	24%	0.0000	26%	24%	0.0011
severe stunting	7%	7%	0.6929	8%	2%	0.0000	6%9	5%	0.0776	6%6	11%	0.0000
wasting	15%	9%6	0.0000	19%	9%6	0.0000	7%	8%	0.0336	10%	8%	0.0000
N	84	87		74	61		154	144		127	131	
Rural												
stunting	37%	31%	0.0000	33%	23%	0.0000	54%	51%	0.0000	40%	42%	0.0000
severe stunting	13%	11%	0.0000	19%	7%	0.0000	16%	17%	0.0000	16%	15%	0.0365
wasting	12%	11%	0.0000	19%	11%	0.0000	11%	13%	0.0000	12%	9%6	0.0000
Z	309	277		277	250		550	544		539	497	

Appendix Table 2: Nutrition Indicators for Children Under Five by Sex, 1998 and 2006

Sources: Own calculations based on VLSS98 and VHLSS06

			< 24 m	onths					>=24 n	nonths		
		boys			Girls			Boys			Girls	
	1998	2006	Two sample mean comparison test P-value	1998	2006	Two sample mean comparison test P-value	1998	2006	Two sample mean comparison test P-value	1998	2006	Two sample mean comparison test P-value
Urban												
stunting	22%	20%	0.0489	19%	11%	0.0000	27%	26%	0.1390	24%	24%	0.6679
severe stunting	7%	8%	0.0548	7%	2%	0.0000	6%9	6%6	0.0000	5%	11%	0.0000
wasting	15%	19%	0.0004	6%6	6%6	0.9938	7%	10%	0.0000	8%	8%	0.8439
Ν	84	74		87	61		154	127		144	131	
Rural												
stunting	37%	33%	0.0000	31%	23%	0.0000	54%	40%	0.0000	51%	42%	0.0000
severe stunting	13%	19%	0.0000	11%	7%	0.0000	16%	16%	0.8084	17%	15%	0.0000
wasting	12%	19%	0.0000	11%	11%	0.0144	11%	12%	0.0000	13%	9%6	0.0000
N	309	277		277	250		550	539		544	497	

Sources: Own calculations based on VLSS 1998 and VHLSS 2006

Appendix Table 3: Nutrition Indicators for Children Under Five by Sex, 1998 and 2006 (with two samples mean comparison)

	Net	Enrollment F	Rates	Gross	s Enrollment	Rates
	Primary	Lower Secondary	Upper Secondary	Primary	Lower Secondary	Upper Secondary
1998						
Kinh and Hoa	93.9	64.1	26	116.2	81.7	35.3
Minorities	83.1	36.1	7.4	124.7	57.4	15.7
Of which						
Khmer and Cham	78.6	20.9	7.4	115.6	38.1	13.1
Tay-Thai-Muong-Nung	95.5	53.4	10.3	128	77	22.4
Other Northern Uplands	78.2	19.5	3.3	121.8	47.4	11.8
Central Highlands	52.1	2.7	1.3	123.6	10.1	1.3
Others	64.1	6.7	8.9	131.3	25.8	8.9
Rural average	91.7	59	22.9	118	77.3	32.1
2002						
Kinh and Hoa	91.7	77.3	42.8	115	93.2	59.7
Minorities	82.4	50.3	18.3	120.5	75.4	31
Of which						
Khmer and Cham	74.3	46.5	10.8	115.1	65.7	18.6
Tay-Thai-Muong-Nung	90.9	66	28	123	93.5	45.6
Other Northern Uplands	78.5	27.9	8.3	125.1	43.9	12.8
Central Highlands	69.2	30	5.6	113	59.6	14.2
Others	97	40.5	0	132.9	90.4	16.2
Rural average	90	73	39.1	116	90.3	55.3
2004						
Kinh and Hoa	93.9	80.1	50.5	106.8	93.7	67.7
Minorities	84.3	56	26.5	114.3	85.9	45.8
Of which						
Khmer and Cham	85.8	50.7	13.7	127.8	70.1	39.8
Tay-Thai-Muong-Nung	91.6	71.4	36.3	114.8	103.9	55.1
Other Northern Uplands	78.9	33.3	19.3	114.1	62.2	38
Central Highlands	74.5	32.3	10.4	108.6	63.4	25.7
Others	67.5	45.7	0	121	68.8	25.1
Rural average	92	75.9	46.5	108.3	92.4	64.1
2006						
Kinh and Hoa	93.4	84.4	58.7	102.2	95.4	73.3
Minorities	85.3	63.6	30.2	107.5	89	51.7
Of which						
Khmer and Cham	90.6	63.3	9.8	122.2	77.4	18.6
Tay-Thai-Muong-Nung	88.8	79.1	43.1	102.3	104.4	73.2
Other Northern Uplands	80.8	47.2	15.8	108.1	76.8	27
Central Highlands	79.3	40.6	17.2	110.8	70	33.7
Others	98.6	48	42.2	117.1	69.2	52.8
Rural average	91.6	80.4	53.6	103.4	94.2	69.4

# Appendix Table 4: Gross and Net Enrolments Rates for Rural Areas, 1998 and 2006

Sources: Own calculations based on VLSS 1998 and VHLSS 2002, 2004 and 2006

# Appendix Table 5. Transfers as a Percentage of Beneficiary Household Expenditures

	Education assistance⁺	Social assistance (A)	Social insurance (B)	Social protection payments (A+B)
1998				
Kinh and Hoa	0.7	5.4	11.4	20.0
Ethnic minorities	3.3	5.1	9.5	20.9
Of which				
Khmer and Cham	0.0	0.9	0.1	7.1
Tay-Thai-Muong-Nung	5.1	4.8	12.0	22.6
Other Northern Uplands	0.0	19.2	18.7	27.3
Central Highlands	2.5	3.5	5.0	15.1
Others	9.9	1.4	0.0	3.3
Rural average	2.0	5.3	11.1	20.1
2006				
Kinh and Hoa	0.4	18.6	45.1	31.1
Ethnic minorities	2.2	16.6	45.4	26.5
Of which				
Khmer and Cham	0.6	30.1		30.1
Tay-Thai-Muong-Nung	1.5	19.6	43.8	31.4
Other Northern Uplands	2.2	10.8	64.3	21.1
Central Highlands	3.3	12.6	43.0	14.6
Others	10.7	18.2	42.7	36.5
Rural average	0.9	18.3	45.1	30.4

Sources: Own calculations based on VLSS98 and VHLSS06

Appendix Table 6: OLS Estimates for Log per Capita Household Expenditure Regression Models of the Majority and Minority Groups, 1998-2006

	19	866	2(	04	2(	906
	Majority	Minority	Majority	Minority	Majority	Minority
Household size	-0.0577***	-0.0692***	-0.0483***	-0.0574***	-0.0393***	-0.0806***
	(0.01)	(0.012)	(0.008)	(0.011)	(0.01)	(0.01)
Proportion of children aged from 7 to 16 years	0.397***	0.5735***	0.2818***	0.474***	0.2692***	0.5023***
	(0.066)	(0.124)	(0.059)	(0.108)	(0.06)	(0.103)
Proportion of male adults	0.5968***	0.4642***	0.7953***	0.7265***	0.7014***	0.574***
	(60.0)	(0.101)	(0.07)	(0.154)	(0.072)	(0.12)
Proportion of female adults	0.4769***	0.5092***	0.6711***	0.5904***	0.65***	0.7573***
	(0.082)	(0.164)	(0.073)	(0.156)	(0.074)	(0.13)
Household type 2: parents and one child	-0.0446	-0.0808	-0.0372	-0.0497	-0.0257	0.1756**
	(0.042)	(0.102)	(0.034)	(0.101)	(0.032)	(0.091)
Household type 3: parents and two children	-0.1009**	-0.1164	-0.0209	-0.1609*	-0.0685**	0.0632
	(0.043)	(0.105)	(0.036)	(0.093)	(0.036)	(60.0)
Household type 4: parents + > three children	-0.1512***	-0.2228**	-0.0996**	-0.2196**	-0.1544***	0.0117
	(0.049)	(0.103)	(0.043)	(660.0)	(0.045)	(0.093)
Household type 5: three-generation household	-0.1093*	-0.1999**	-0.0878**	-0.1437	-0.1143***	0.0398
	(0.058)	(0.098)	(0.044)	(0.104)	(0.045)	(0.092)
Household type 6: other household structures	-0.1468***	-0.1612*	-0.046	-0.1905*	-0.0345	0.0861
	(0.052)	(0.096)	(0.045)	(0.104)	(0.047)	(0.094)
Age of household head	0.007	0.0013	0.0005	-0.0078	0.007*	0.0033
	(0.005)	(0.006)	(0.004)	(0.008)	(0.004)	(0.006)
Age of head squared (divided by 100)	-0.0068	-0.0009	-0.0017	0.0048	-0.0099**	-0.0043
	(0.004)	(0.007)	(0.003)	(0.007)	(0.004)	(0.006)
Household head is female	-0.005	-0.0782***	0.0281	0.0098	0.0132	-0.0833**

06	Minority	(0.043)	0.1748***	(0.037)	0.2508***	(0.04)	0.4406***	(0.049)	0.6215***	(0.053)	0.6652***	(0.1)	0.0068*	(0.004)	0.0065***	(0.001)	0.0119***	(0.003)	0.001***	(0)	0.0219***	(0.005)	-0.0105*	(0.006)	-0.1057	(0.089)
20(	Majority	(0.019)	0.1373***	(0.028)	0.2225***	(0.028)	0.3754***	(0.031)	0.5224***	(0.031)	0.7494***	(0.037)	0.0087***	(0.001)	0.0037	(0.002)	0.015***	(0.002)	0.0001	(0.001)	0.0115***	(0.002)	0.0042	(0.011)	0.0062	(0.035)
104	Minority	(0.05)	-0.1952***	(0.04)	0.1354***	(0.029)	0.3374***	(0.053)	0.3422***	(0.055)	0.605***	(0.105)	0.0103***	(0.003)	0.0081***	(0.002)	0.0093***	(0.002)	0.0002	(0)	0.025*	(0.015)	0.0078	(0.006)	0.0011	(0.158)
20	Majority	(0.02)	-0.1805***	(0.029)	0.0844***	(0.017)	0.2399***	(0.022)	0.3543***	(0.023)	0.6234***	(0.032)	0.0093***	(0.001)	0.0039***	(0.001)	0.0053	(0.003)	0.0011*	(0.001)	0.011***	(0.002)	0.0231***	(0.004)	-0.0062	(0.031)
968	Minority	(0.026)	-0.1199*	(0.068)	0.1142**	(0.048)	0.29***	(0.048)	0.3453***	(0.07)	0.4527***	(0.148)	0.0146***	(0.004)	0.0047	(0.007)	0.0251***	(0.006)	0.0044**	(0.002)	0.0101	(0.030)	0.0074	(0.005)	-0.4104***	(0.135)
19	Majority	(0.024)	-0.1265**	(0.058)	0.126***	(0.023)	0.2725***	(0.027)	0.3057***	(0.032)	0.5696***	(0.038)	0.0064***	(0.002)	0.0028	(0.002)	0.0124***	(0.001)	0.0076***	(0.003)	*0000	(00.0)	0.0065***	(0.002)	0.0021	(0.06)
			Most educated member: primary education		Most educated member: lower secondary		Most educated member: upper secondary		Most educated member: vocational/technical		Most educated member: college/university		Irrigated annual crop land $(1000 \text{ m}^2)$		Non-irrigated annual crop land $(1000 \text{ m}^2)$		Perennial land $(1000 \text{ m}^2)$		Forest plot $(1000 \text{ m}^2)$		Water surface $(1000 \text{ m}^2)$		Other cultivated lands $(1000 \text{ m}^2)$		Geographical types: rural coastal	

	19	98	20	004	20	06
	Majority	Minority	Majority	Minority	Majority	Minority
Geographical types: rural midlands	-0.0407	-0.4875***	0.0175	0.0639	0.0058	0.0302
	(0.095)	(0.16)	(0.03)	(0.158)	(0.042)	(0.144)
Geographical types: rural low mountain	-0.1224**	-0.2617**	-0.0338	-0.1644**	-0.056	-0.2675***
	(0.05)	(0.121)	(0.021)	(0.06)	(0.039)	(0.085)
Geographical types: rural high mountain	0.0016	-0.2968***	0.0234	-0.2618***	-0.0191	-0.3347***
	(0.07)	(0.101)	(0.041)	(0.059)	(0.05)	(0.085)
Commune having access to road that car can travel	0.0355	0.0114	0.0032	0.0762	-0.047**	0.0112
	(0.051)	(0.072)	(0.043)	(0.091)	(0.023)	(0.038)
Commune having access to public transport	0.0538	-0.0466	0.0585***	0.0514	0.0474***	0.0763**
	(0.045)	(0.073)	(0.016)	(0.032)	(0.016)	(0.03)
Commune having access to post office	0.0563	0.1086	0.0456***	-0.0418	0.0003	-0.0338
	(0.045)	(0.094)	(0.018)	(0.035)	(0.019)	(0.035)
Commune having access to daily market	0.0849**	-0.0269	0.0988***	0.1572***	0.0742***	0.1026**
	(0.037)	(0.098)	(0.017)	(0.048)	(0.019)	(0.045)
Commune having access to electricity	0.0806	0.166*	0.0265	0.0584	0.5855**	0.2086***
	(0.079)	(660.0)	(0.044)	(0.047)	(0.272)	(0.078)
Commune having factories located within 10km	0.057	-0.0575	0.0676***	0.0921***	0.1114***	0.0601**
	(0.04)	(0.074)	(0.016)	(0.033)	(0.017)	(0.03)
Constant term	7.0435***	7.2948***	7.454***	7.5966***	7.007***	7.3286***
	(0.151)	(0.222)	(0.108)	(0.215)	(0.288)	(0.201)
$\mathbb{R}^2$	0.3162	0.4726	0.3122	0.4468	0.3078	0.4574
Number of observations	3,590	680	5,531	1,181	5,559	1,269

Notes: \*\*\*, \*\*, and \* denotes statistically significant at 0.01, 0.05 and 0.1 levels respectively.

Sources: Own calculations based on VLSS and VHLSS

Appendix Table 7: Budgetary Expenditures on the Main Ethnic Minority Policies and Programs

Programme	Objective(s)	Target Group	Executive Agencies	Total Budget (VND billions)	Budget Period	VND billions per annum <sup>1</sup>	Reference
Programme 143	Poverty reduction and employment creation	Nationally targeted	MOLISA, MOH, MOET, MARD, SBV	8,387	2001- 2005	1677.4	NTP on HEPR (2005)
Programme 135 – Phase I	Infrastructure improvement	Initially the 1,000 poorest communes, rising to 2,410 communes in 2005, and then scaled back to approximately	CEM	6331.6	1999- 2005	904.5	CEM (2006b)
	Infrastructure construction for communal centres	1,800 communes in 2006		1671	1999- 2005	238.7	
	Resettlement projects			73.6	1999- 2005	10.5	
	Agricultural and forestry production and marketing			60	2002- 2005	15	
	Training			284	2001- 2005	56.8	
Programme 135 – Phase II	Project on production promotion and economic restructure	1,946 Region-3 communes and 3,149 Region-2 extremely difficult villages	CEM	846.4	2006- 2008	282.1	NTP on HEPR (2009)

1. Total budget divided by the budget period.

rogramme	Objective(s)	Target Group	Executive Agencies	Total Budget (VND billions)	Budget Period	VND billions per annum <sup>1</sup>	Reference
	Project on infrastructure improvement			4,215	2006- 2008	1405	
	Project on capacity building and training			284.3	2006- 2008	94.8	
	Policy on social service supports, civil welfare improvement, legal awareness improvement			1,259.8	2006- 2008	419.9	
	Phase 2 as total			16,039	2006- 2010	3,208	
Resettlement and Sedentarization Programme	Resettlement, poverty reduction and environment protection	Ethnic minority and mountainous areas, and afforestation areas	CEM/MOLISA/ MARD	735	2000- 2004	147	Le et al (2006)
		Decision 33/2008	CEM	133	2008	133	Vi (2008)
Policy of	Poverty reduction	Ethnic minorities whose population is below 10,000 persons, poor households					
Support for			CEM	182	2001- 2006	30.3	Phan (2006)
Extremely Difficult Ethnic Minority Households							

Programme	Objective(s)	Target Group	Executive Agencies	Total Budget (VND billions)	Budget Period	VND billions per annum <sup>1</sup>	Reference
Programme 134	Production land, residential land, houses and water for ethnic minorities	Poor ethnic minority households and villages	CEM	4,482.6	2004- 2008	896.5	NTP on HEPR (2009)
Programme 327	Regreening bare hills, protection forest	Afforestation areas	MARD	1082.4	1996- 1998	360.8	MOLISA (1999)
Educational National Target Programme	Support for the education of ethnic minorities and disadvantaged regions	Ethnic minorities and disadvantaged groups	CEM, MOET	510	2007	510	MOET (2007)
Programme 139	Increase the access to health service	Poor households, poor households in P135, Decision 960, and 656 areas	MOH, Social Insurance	2304	2002- 2006	460.8	NTP on HEPR (2005)
Price and transportation subsidies	Decrease the price difference due to remoteness	Poor households and region 3 communes	CEM, Ministry of Trade, MOF, MPI and	512	2004- 2005	256	Dinh (2006)
			Price Committee	600	2006- 2007	300	Vi (2008)
				1,200	2007- 2010	300	Vi (2008)
Communication and Information	Information and knowledge	Ethnic minority and remote areas				80	Vi (2008)

Source: Updated from "A Review of Ethnic Minority Policies and Programmes in Vietnam" (Nguyen, P.T.T. and Baulch, B., 2007)

# Appendix Table 8. Relevant Decisions, Decrees and Resolutions

# HEPR AND EMPLOYMENT CREATION PROGRAMME

Resolution 120/HDBT by the Council of Ministers in 1992	Decisions on National Programmes on Employment Creation, and National Fund for Employment Creation
Programme 133 (Decision 133/1998/QD-TTg)	Decision on National Programme on Hunger Eradication and Poverty Reduction (HEPR) in the period of 1998- 2000. The objective is to eliminate chronic hunger and reduce the percentage of poor households in the whole country to 10% by 2000.
Programme 143 (Decision No 143/2001/QD-Tg)	Decision on National Programme on HEPR and Employment Creation in the period of 2001-2005. This Programme resulted from the merge of Programme 133 and Programme 120.
Decree No. 78/2002/NĐ-CP	Decree on credit for the poor and policy-targeted groups, including ethnic minorities.

**INFRASTRUCTURE AND OTHER COMPONENTS – PROGRAMME 135** 

Decision 35/1997/QD-TTg	Programme on communal centres in the mountainous and upland areas.
Programme 135	Supports for the socio-economic development of extremely difficult communes in the ethnic, mountainous, boundary and remote areas.
(Decision 135/1998/QD-TTg)	Pay attention to infrastructure improvement to the level of communes.
Decision 237/1998/QD-TTg	National Target Programme on Clean Water and Sanitation, Environment in rural areas.
Decision 140/1999/QD-BNNPTNT (based on Decision 72/HDBT in 1990)	Design the resettlement and sedentarization component under Programme 327. Set up guidelines for resident planning, infrastructure development, and production supports which focused solely on ethnic minorities that practiced shifting cultivation, have a little or no stable cultivation land. Their livelihoods depend mainly on income earned from deforestation for shifting cultivation (50% of income and up). Their residences are not stable and change with the shifting of agricultural fields.
Decision 22/QD-TTg in 1999	National Programme on Electricity Network Development in Rural Areas.
Decision 138/2000/QD-TTg	Integrate the earlier National Targeted Programme on HEPR components on sedentarization, supports for especially disadvantaged minorities, and communal centre development in mountainous communes into Programme 135.
Decision 07/2006/QD-TTg	Åppove the Programme 135 in the period 2006-2010 (Phase II)
Decision 164/2006/QD-TTg	Approve 1,644 communes in the ethnic minority and mountainous areas, bounder, and historical resistance sites in the second phase of Programme 135.

Decision 113/2007/QD-TTg	Approve additional 155 communes in the ethnic minority and mountainous areas, bounder, and historical resistance sites in the second phase of Programme 135. Approve 301 difficult communes in the coastal line and islands to receive supports for infrastructure since 2008.
	receive supports for infrastructure since 2008.

#### **RESETTLEMENT AND SEDENTARIZATION**

DEMOCRACY

Instruction 393/1996/CT-TTg	Residential planning for economic development in the ethnic mountainous area.
Decision 140/1999/QD-BNN	Criteria and plans of resettlement and sedentarization.
Decision 190/2003/QD-TTg and Circular 09/2004/TTLT-BNN-BTC	Guidelines for Residential planning in the period of 2003-2020.
Decision 193/2006/QD-TTg	Residential planning for 75,000 households in the special-used forests up to 2010.
Decision 33/2007/QD-TTg	Support for migration Programmes for resettlement and sedentarization for the ethnic minorities in period of 2007-2010. One-off grant up to VND 15 mil/household. Support for villages on infrastructure, cadres training, and local budget. Applied for non-P134-P190-P120-P193 cases.

#### POLICY OF SUPPORT FOR EXTREMELY DIFFICULT ETHNIC MINORITY HOUSEHOLDS

Decision 826/1995/QD-TTg	Policy of Support for Extremely Difficult Ethnic Minority Households.
Decision 30/2007/QD-TTg	Define the ethnic minority extremely difficult areas.
Decision 32/2007/QD-TTg	Free-interest loans to ethnic minorities in extremely difficult areas up to VND 5 mil.

Decree 79/2003/ND-TTg Grass-root democracy at the commune level, which has created a strong basis for the decentralization of Programme 135 and others to the commune level. Local people have the right to participate, supervise, and assess any projects in the local area which directly impact their local production, security, society and livings.

PROGRAMME 134	
Decision 132/2002/QD-TTg	Supports for residential and production land for ethnic minorities in Central Highlands (support of VND 4 mil per ha of reclaimed land).

Decision 105/2002/QD-TTg	Supports for loans for houses by instalments in the flooding in Mekong river delta.
Decision 154/2002/QD-TTg	Supports for loans for houses by instalments in the flooding in Central Highlands.
Decision 134/2004/QD-TTg	Supports for production land, resident land (houses) and water for difficult ethnic minority households. P134 Budget will be repaid for their previous loans under these 2 Decisions of 105 and 154.
Joint Circular 819/2004/TTLT- UBDTKHDT-XD-NNPTNT	Guidelines for P134: supports of VND 5 mil per ha/house is the minimum; local budget contribution is required as at least 20% of the national budget.
Decision 03/2005/QD-BNN	P134 households can exploit timber wood to built houses in extremely poor and difficult situation.
Decision 1143/2006/QD-TTg	Approved advances of VND 105 bil for participatory irrigation projects at the medium and small size which are really needed for ethnic minorities in the remote Central Highlands.

FOREST LAND ALLOCATION	
Decision 327/CT in 1992	National Programme on Reforestation to re-green of barren hills. It provided direct payment to households in exchange for forest protection and for State Forest Enterprises to establish forest plantations.
Land Law 1993	Agricultural and forest land can be allocated to households. The state officially recognized the land use rights of farm households, including the right to sell, transfer, and assign land.
Decree 02/CP in 1994	Long-term forest land allocation to organizations, households, and individuals for the forestry objective in the ethnic policy for the first time.
Decree 01/CP in 1995	Long-term forest land contracts to organizations, households and individuals.
Decision 661/1998/QD-TTg	5-million ha afforestation to rehabilitate degraded forest lands in the period of 1998-2005. Households commonly received some credit or other help to get trees replanted and were often promised a piece-rate payment per ha for protection of the land and growing tree seedlings (around 30-50,000VND per year per ha).
Decree 163/1999/ND-CP	Production forest allocation to households and individuals. Land allocation and lease, forest protection and management. Households were granted "Red Books", and household enjoyed more land-use rights than what the "Green Books" allowed.
Decision 3011/2000/UB	Son La provincial decision to implement the Programme of Forestry Land and Forest Allocation to households, individuals, organizations and communities in 2000-2003 in Son La province.
Decision 178/2001/QD-TTg	Benefits from forest land allocation to households and individuals.

Decree 197/2004/ND-CP	Compensation and resettlement applied in forest reallocation: land is compensated from the national budget at VND 5 mil per ha. Local budget contribution was required as at least 20% of the national budget.
Decision 04/2004/QD-BNN	Procedures to exploit timber wood and other forest products.
Decision 146/2005/QD-TTg	Reallocate production lands from forest state enterprises to poor ethnic minority households.
Decision 304/2005/QD-TTg	Pilot forest allocation to households and communities (priorities to P132 and P134 cases in Central Highlands) with the annual support of VND 50,000/ha (which was increased to VND 100,000 per ha later).
Law on Forest Protection and Development in 2004 and Decree 23/2006/ND-CP	Forest allocation to households, organizations and village communities for forest protection and development. Normally, each household can have less than 30ha in less than 50 years.
Decision 147/2007/QD-TTg	<ul> <li>Policies on Production Forest in 2007-2015:</li> <li>Individuals, households, communities under Decision 164 (extremely difficult communes) receive supports to re-green in barren hills <ul> <li>o VND 3 mil/ha for big timber (generate income after above 10 years) or VND 2 mil/ha for small timber (less than 10 years)</li> <li>o Additional VND 1 mil/ha if in the boundary</li> <li>o Additional VND 1 mil/ha if in the resettlement area of hydro electric power project</li> </ul> </li> <li>Ethnic minority households, individuals and communities not under the Decision 164 receive supports to re-green in barren hills of VND 2 mil/ha</li> <li>Other cases receive supports of VND 1.5 mil per ha or per 1,500 trees</li> </ul>

STATE FOREST ENTERPRISE REFORM	
Law on State-Owned Enterprise 1995	State-Owned Enterprise Reform.
Decree 50/1998/ND-CP	State Forest Enterprise Reform initiated.
Decision 187/1999/OD-TTg	Reform of State Forest Enterprise to independent by

usiness enterprise in order to separate the public services and business activities, and to achieve a sustainable and efficient forest management. One of expectation is to release a large forest land to households.

#### Joint Circular 199/1999/TTLT/ Implementation guidelines for the Decision 187 from the MARD and MOF. BNNBTC

Decree 10/2002/ND-CP Protection Forest Management Board will operate under the provincial People Committee.

Decree 170/2004/ND-CP Reform of state farm.

Decree 200/2004/ND-CP	Decree on the Arrangement, Reform and Development of State Forest Enterprises. A further State Forest Enterprise Reform on the restructuring of State Forest Enterprises, their transformation into either commercially viable wood businesses or effective public service entities, in particular, for forest protection. Create the legal basis for State Forest Enterprise Equitization. SFEs for public services are reformed to Protection Forest Management Board. National budget is only for Special – Used and Protection Forest. Production Forest will be allocated to business SFEs (one- member limited liability companies), households, and individuals.
Decision 231/2005/QD-TTg	Supports for state-owned forest enterprises to employ ethnic minority residents in 5 provinces in Central Highlands.
Circular 10/2005/BNNPTNT	Implementation guidelines for the Decree 200 from the MARD.
Decree 23/2006/ND-CP	Regulation on the implementation of Forest protection and development law.

EDUCATION	
Decision 66 in 1985 by MOET and Circular 23 in 1985 by MOET	Regulations on organization and operation of boarding schools for ethnic minority children.
Decision 55/BGD in 1990	MOET has encouraged all 5 to 6 year pre-school children to attend one-year of (typically half-time) kindergarten, or at least, the 36-day summer-school Programme.
Law on the Universalisation of Primary-education in 1991	It encouraged schools to use the ethnic minority languages along with Vietnamese in primary school classes in ethnic minority areas.
Joint Circular 17 in 1995/ by MOLISA, MOF, MOET	Financial supports for teachers delivering extra classes and combined classes.
Decision 2590/1997/QD-BGD and Circular 16/1997/TT-BGD	Prepare ethnic minority students for university and vocational training and to develop cadres of ethnic minority teachers. Include the revision on organization and operation of boarding schools for ethnic minority children.
Decision 973/1997/QD-TTg	The five-level allowance system gives priority to mountainous regions and islands to attract more cadres and teachers.
Circular 01/1997/TT-BGD	Guidelines on teaching the oral and written languages of ethnic minority.
Joint Circular 54/1998/TTLT- BTCBGD	Guidelines on school fees in the public educational system.

Joint Circular 126/1998/TTLT- BTCBGD	Financial supports for students in the ethnic boarding schools and pre-universities: exemption from school fee and examination fee; annual award if fairly-good qualification; personal staff: blanket, net, coat, mat, rain coat, trousers, shirt (uniform); two-way travelling cost once a year to visit his family; stationary (note, bag, pen, pencil, a set of colour pencils, eraser, compasses, ruler, knife or scissors, glue, colour papers); and borrow textbook.
Decision 159/2002/QD-TTg	Programme on school and class infrastructure improvement; Erase the temporary classrooms and 3-shift classes.
Decision 1214/2001/BTC	Free 48-page notebook (15 books/1-2nd–grade pupil; 22 books/3- 5th-grade pupil) to pupils from mountainous and extremely difficult area.
Circular 04/2001/TTLT- BGDBTCCBCP-UBDT	The nomination policy ( <i>Cu tuyen</i> ): Pupils from local ethnic minority households (above 5 years of permanent residence) in the extremely difficult, and border areas, completed the upper-secondary education in the previous 3 years, will be selected to be under the nomination policy. They have to attend the 1-year pre-university, and then, be sent to the university/college/professional secondary schools without entrance exam. If their pre-university study result is better than Fairly Good, they will study with other normal students. If not, they will have a separated class. After graduated, they have to come back to work for their hometown in a given period at least double of their studying period.
Decision 194/2002/QD-TTg and Joint circular 13/2002/TTLT-BGD- BTC	Adjustment in scholarship and social supports for ethnic minority students in public schools.
Instruction 38/2004/CT-TTg	Classes on ethnic minority languages for cadres working in the ethnic mountainous areas.
Decision 267/2005/QD-TTg	Policy on priorities in vocational training for ethnic minority students in boarding schools.
Decision 164/2005/QD-TTg	Programme of "Develop distance education in the period of 2005-2010".
Decree 134/2006/ND-CP	The revised nomination policy ( <i>Cu tuyen</i> ): No entrance exam. After graduated, they have to come back to work for their hometown at least 5 years (university/college) or 3 years (professional school). Students can join the formal education without pre-university attendance (if he is qualified) and then join the same class with other normal students. The nomination policy allows up to 15% at most of students nominated to be Kinh.
Decision 82/2006/QD-TTg and Joint Circular 43/2007/TTLT/BTC- BGDĐT	Adjustment in scholarship and social supports for ethnic minority students in public schools. Scholarship is increased to VND 360,000 per head per month. Scholarship will be automatically adjusted at 80% of the official minimum average wage.

HEALTH	
Decision 270 in 1993 by PM	Strategy for Population and Family Planning until 2000.
Decree 95/CP in 1994	People from mountainous area as decided by CEM are exempted from health expenses.
Decision 576/1995/QD-TTG	National Plan for Nutrition 1995–2000.
Resolution 37/1996/NQ-CP	Strategy for Health Care for the Periods 1996–2000.
Decision 237/1998/QD-TTg	National Target Programme on Clean Water and Sanitation, Environment in rural areas.
Decision 139/2002/QD-TTg	Programme 139 - National Free Health Care Fund for the poor. People having Poor Household Certificate, living in the P135 communes, areas under Decision 186 (6 provinces in the Northern mountainous) and under Decision 168 (Central Highlands), will be provided the health insurance cards. Each province will have a Health Care Fund for the Poor of which at least 75% is from the National budget. The total budget of Fund is VND 70,000/per head/ year at least.The Fund will pay VND 50,000/per head/year for the health insurance cards or directly pay for actual health expenses upon receipts.

# PRICE AND TRANSPORTATION COST SUBSIDY

Decree 20/1998/ND-TTg, the amended Decree 02/2002/ND-CP, and Joint Circular 07/2002/TTLT/BTM- UBDTBTC-BKHDT Joint Circular 11/2005/TTLT- BNVBLDXH-BTC-UBDT	The objective is to make the sales price of some social-policy items such as salt, petroleum, books, seedlings, fertilizers, and the purchase prices of agricultural/aquacultural/forest crops are the same for farmers living in remote communes as in the provincial town. Guidelines for the implementation of subsidy system in different regions.
COMMUNICATION	
Decision 975/2006/QD-TTg preceded by Decision 1637/QD- TTg in 2001	Programme 975 provides 14 different newspapers and journals free to schools, libraries, commune PCs, district PCs, provincial PCs, provincial departments of ethnic minorities, border points, and villages in the ethnic minority, mountainous and extremely difficult areas.
REGIONAL PROGRAMME	
Instruction 393/TTg in 1996	Instruction on population planning and upgrading infrastructure, production arrangement in ethnic and mountainous areas.
Decision 656/1996/QD-TTg	Decision on socio- economic development in the Central Highlands for the period of 1996-2000.

Decision 960/1996/QD-TTg	Decision on orientation of socio- economic development in the North Mountainous region in the long term.
Instruction 515/TTg in 1997	Instruction on stimulating implementation of the Programme on Exploitation and Socio-Economic Development in Dong Thap Muoi.
Programme 186 (Decision 186/2001/QD-TTg)	Supports for the Northern Mountainous Socio-Economic Development.
Programme 173 (Decision 173/2001/QD-TTg)	Supports for the Mekong River Delta Socio-Economic Development.
Programme 168 (Decision 168/2001/QD-TTg)	Supports for the Central Highlands Socio-Economic Development.
Decision 120/2003/QD-TTg	Supports for the socio-economic development of provinces along the Vietnam-China boundary.
Decision 174/2004/QD-TTg	Supports for the socio-economic development of 19 provinces and 64 mountainous districts bordering the Central Highlands, the west of old Region 4, and the Northern Mountainous area based on the Programme 186 and 168.
Decision 113/2005/QD-TTg	Action Plan of the Government on the framework for the socioeconomic development and security of the Northern Central Coast and Southern Central Coast to 2010.

Source: Updated from "A Review of Ethnic Minority Policies and Programmes in Vietnam" (Nguyen, P.T.T. and Baulch, B., 2007) 4

# Productivity, Net Returns and Efficiency: Land and Market Reform in Vietnamese Rice Production

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#### **1.Introduction**

Vietnam has achieved remarkable progress in reducing rural poverty in the last thirty years, due largely to a series of extensive market and land reforms in agriculture, along with impressive increases in economic growth at the national level. The land and market reforms in agriculture were pervasive, moving the system of rice production in particular from commune-based public ownership and control to one with effective private property rights over land and farm assets, competitive domestic markets and individual decision making over a wide range of agricultural activities. The substantial incentive effects created by these policy measures, inducing farmers to work harder and use land more efficiently, have been estimated to be as much as fifty per cent of the increase in total factor productivity (TFP) during the peak of the reform period (Che et al. 2006). Overall, given these reforms, Vietnam has gone from being a large importer of rice in 1976-80, to now the second largest exporter of rice in the world, with considerable increases in farm profitability and rural incomes and resulting rural poverty rates falling by over sixty percent from 1993 to 2004 alone (Hansen and Nguyen 2007).

However, much still remains to be done to increase living standards in rural areas and enhance general rural development. Like many reform processes, the early rapid increases in economic activity have dissipated over time, with the suggestion now of a TFP 'slow down' in rice production in many areas in Vietnam. In addition, many of the poor still farm small areas of land, constrained in use, often with fragmented or non-contiguous plots and with little or no human and physical capital accumulation or access to agricultural extension services. Much of this is due to remnants from past institutional arrangements, but also to continued constraints in land use, credit availability and the provision of rural services, all calling for further or renewed land policy and market reform.

This paper has two basic tasks. First, it assembles a data set from 1985 to 2006 to measure the changes in TFP, terms of trade and net returns in Vietnamese rice production, both in the principal rice growing areas and throughout the country. The results track the effects of the major land and market reform process, and beyond, and determine key differences in TFP and net returns over time and by region. All of this speaks directly to existing land use practices and is suggestive of needed policy response. With this is mind, the second task is to isolate the remaining institutional constraints and policy challenges that may be limiting increases in productivity and efficiency. For this purpose, three different stochastic frontier and inefficiency models, with varying samples and levels of aggregation, are estimated to determine the potential effects of ongoing issues over land use and the provision of credit, land fragmentation, less than secure property rights and the lack of rural education and support services.

Section 2 of the paper provides context, highlighting the nature and extent of the past market and land reform process and the remaining institutional barriers and policy challenges in land use practice and rural development. Section 3 briefly summarizes the various data sets used in the paper, along with variable definitions and econometric specification. An extensive data appendix details the sources of the data, as well as data constructions and various adjustments. Section 4 provides the measures of TFP, terms of trade and net returns in rice production, while section 5 provides estimates for the stochastic frontier and inefficiency models. Three different models are estimated, in part due to limitations in the data, and in part to highlight different aspects of the constraints on inefficiency. Here, estimates for the primary provincial data set (1991-99), a period over which there is relative stability in estimated input coefficients, is augmented with estimates drawn from two farm and household surveys for the year 2004. Section 6 concludes<sup>1</sup>.

# 2. Context

Rice continues to dominate agricultural production in Vietnam, with nearly 73 per cent of the population still living in rural areas, and rice accounting for nearly 90 per cent of the output of food grains and almost two-thirds of rural farm income (SDAFF 2006). Although rice is produced in every one of the 60 (recently defined as 64) provinces in Vietnam, the Red River Delta (RRD) and the Mekong River Delta (MRD) are the main rice growing regions. The smallest producers of rice (less than 100,000 tons per year) are in Binh Phuoc province, which is relatively small in area, and contains the principal coffee growing (Gialai Kontum) and mining (Cao Bang, Bac Kan) areas. Provinces with the largest rice output (more than a million tones per year) are located in the MRD (Tien Giang, Soc Trang, Long An, Kien Giang

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and An Giang), which as a whole accounts for roughly half of Vietnam's output of rice and most of its international exports. In terms of natural conditions, the MRD and the RRD are the most favorable for growing rice, with many areas naturally irrigated, producing up to three rice crops per year. Based on farm survey data for 2004 (as used below), the average farm size in the RRD (0.4 hectares per farm) is much smaller than in the MRD (1.4 hectares per farm). However, the number of threshing machines in the RRD is almost double that of the MRD. In the MRD, with a large volume of high-quality rice exports, rice processing takes place in mills rather than on the farm to maintain international standards.

As mentioned, rice output has increased dramatically during the major market and land reform periods, and by more than three times nationwide (10 million to nearly 34 million tons) from 1980 to 2004 (Kompas 2004). After a period of 'output share contracts' (from 1981-87), as a highly tentative move to limited property rights and domestic markets, a period of 'trade liberalization' (1988-94) brought major institutional change, allowing for effective private property rights over both land (initially 10–15 and later 20 year leases) and capital equipment. With reform, most production decisions were de-centralized, all farm income (after tax) was retained by the farmer and rice could be sold freely in competitive domestic markets. The result was an increase in rice prices (from the state controlled low prices prior to reform) and added profitability, which not only increased TFP considerably (Che et al. 2006) but also generated dynamic gains from trade reform from induced capital accumulation out of retained farm earnings (Che et al. 2001).

Since 1994, these dramatic market and land reforms have been solidified and in many cases extended in the 'post-reform' period. (For a detailed discussion of land policy reform in Vietnam, see Chu (1992), Che (1997), Fforde (1996), Marsh and MacAulay (2002) and Nguyen (2006).) Nevertheless, a number of concerns remain, and have been raised again recently in a 'Participatory Poverty Assessment' (PPA), with over 240 focus groups and 1,450 participants, undertaken by the Vietnam Academy of Social Sciences (VASS 2009). Chief among these are issues surrounding land title and use, land fragmentation and the lack of rural credit availability and sup- porting rural services, and especially so (for this paper) as they impact on productivity and efficiency gains.

Land title and use requirements are a good example of the challenges that remain. Although the Land Law of 1993 (amended and clarified in 1998, 2001 and 2003) allows "land use rights to be transferred, exchanged, leased, mortgaged and inherited" (Congress of Vietnam 1993), in practice considerable constraints remain in place regarding both land conversion (i.e., land transferred or converted to other uses) and land accumulation (i.e., trades and accumulation of land plots). For any land conversion, for example, the commune authorities have to first develop a plan, often based on or as mi- nor amendments to past historical 'blueprints' for land use in that area, to submit to various levels of government for approval. The PPA reports that this process is often long and that transactions costs are high, making it difficult for poor farmers in particular to participate (VASS 2009). In addition, although land consolidation in Vietnam is occurring, with a number of important benefits (see Ravallion and van de Walle 2008), there are still restrictions on overall land size. In 2007, the Vietnamese government increased limits on the transfer of land use rights for annual agricultural land from 3 to 6 hectares for other cities and provinces. This is a welcome

albeit modest change for many farmers, but in most cases rice farming outside of the MRD is still takes place on very small farms, at subsistence levels (GSO (VHLSS) 2004, VASS 2009).

Part of the obstacle to land consolidation is the lack of fully secure property rights. Land use title for agricultural land was extended from 15 to 20 years with the Land Law of 1993, but in many cases even 20 years is too short to provide secure rights in the shift to larger farms, or to a process where farm land is turned into use for small manufacturing or industry. Overall the process of land certification or entitlement itself has also been below expectations. Household survey data from 2004 (GSO (VHLSS) 2004) suggests that only 76 percent of agricultural land parcels, 68 percent of urban land parcels and 34 percent of forest land parcels have been granted land-use right certificates. In practice, this means about two third of the total parcels of Vietnam still lack a certificate (World Bank 2009). Even where land certificates do exist, there is a shortage of basic infrastructure for an effective operation of land administration, including cadastral mapping, transaction registrations and record management in the provision of land administration services. Problems are compounded by lack of information or public awareness and the apparent limited capacity of land administration staff, especially at the commune and district levels (World Bank 2009). It is perhaps for this reason that real estate markets have been slow to develop, with recent data indicating that the role of land rental markets in agriculture in rural areas remains thin (GSO (VHLSS) 2004), and that continued government restrictions often prevent low cost and efficiency enhancing transfers (Deininger and Jin 2008). Land rights that are not secure also clearly impact on credit availability and capital accumulation. The PPA reports that farms without land-use certificates, which would normally be used as collateral, are not able to obtain even short term loans, much less transfer land use entitlements. This is also often true for farms with land tenures that are close to expiry, as most currently are, given the 20 year leases initiated in 1993 (VASS 2009).

Land fragmentation occurs when farms have land use rights to a number of often small, non-contiguous plots. With reform and the resulting dissolution of the commune system in Vietnam, land was allocated to prior commune members in a roughly equalitarian manner: equal numbers of plots per household, with a distribution of plots throughout the commune so that no one household would have a concentration of plots in the most fertile parts of the commune, or near roads, water sources or other essential services. Immediately after the major reform process (1988-94), there were as many as 75 to 100 million parcels or plots of land in Vietnam and on average about seven to eight plots per household (World Bank 2003) and Hung et al. 2007), of which about 10 per cent of these plots had an area of only 100 square meters or less (Phien 2001). Evidence suggests that plot numbers have been falling recently with land consolidation (nationwide, falling to 4.3 plots per household with the fall in the north from 6.0 to 4.9 plots (GSO (VHLSS) 2004), but the problem is still common. Fragmentation levels, for example, continue to remain high in the RRD, the most populated region, with 90 percent of the households having rice farm sizes of roughly 0.2 to 0.5 of a hectare (Chu 2008) and an average of 4.6 plots per farm (GSO (VHLSS) 2004). The number of plots per farm in the MRD, by contrast, is only 1.6. In some cases (e.g., risk spreading), fragmentation may be an advantage (see Marsh et al. 2006), but for the most part small and scattered land holdings hamper mechanization, the use of buffaloes and tractors and technological adaptation, as well as generate additional time and labour for farming activities that must have been carried out in geographically distant plots. The embankments that

separate plots alone have been estimated to reduce total agricultural land for cultivation in Vietnam by 2.4 to 4 per cent (Thanh 2008).

# 3. Data sources, variables and specifications

Four different data sets are used in this paper. The first is a provincial level data set on rice production in Vietnam, from 1985 to 2006, for 60 provinces, used to construct TFP, price and quantity indexes and net return measures, greatly improving on the basic TFP estimates (to 1994) provided in Che et al. (2006). This is an extensive data set on prices and quantities for all rice outputs and inputs, directly obtained as or aggregated to provincial averages. The key variables include paddy rice output, labour, land, material inputs (especially fertilizer, but also seeds and pesticide), capital (a measure of tractors and buffaloes), as well as input prices for labour, land, fertilizer, pesticides and capital used in rice production. (See Appendix 1 for detailed data sources, constructions and adjustments.) The second data set, used to construct a stochastic production frontier and inefficiency model, is a subset of the first, or a balanced panel data set for 60 provinces from 1991 to 1999. The key variables are rice output, capital, labour, land, fertilizer (and other material inputs) and measures of farm characteristics by location, size and the proportion of tractors used per area of cultivated rice land. The choice of using the sub-sample for 1991-99, rather than the entire sample 1985-2006, was made based on a series of Chow tests for structural breaks to test whether input elasticities were constant over time, with Goldfeld- Quandt tests confirming the hypothesis of different sub-sample variances, especially after the year 2000. The years 1991-99 thus provided the most consistent provincial-level data set with relatively stable input elasticities.

The third data set, also used to construct a stochastic production frontier and inefficiency model, is a farm survey data set, for 388 rice farms, conducted in 2004 in major rice growing regions (the MRD and RRD), de- signed especially to isolate the potential effects on inefficiency from land fragmentation. Key additional variables include measures of soil quality and irrigation, and the number of plots, as a proxy for land fragmentation, along with level of education of the head of the farm. The fourth data set uses the 2004 Vietnam Household Living Standards Survey (VHLSS) to partly confirm the results of the smaller farm survey data set, along with providing added estimates of the effects of secure property rights and access to agricultural extension services. The VHLSS is a household survey data set of roughly 9,000 households in 2,216 communes, with cluster-sampling techniques to cover the entire country, conducted by the General Statistical Office (GSO) in Vietnam in selected years (i.e., 2002, 2004 and 2006). The 2004 data set, in particular, has separate components for land use and agricultural production. Sample size is reduced to 3865 households to isolate farms that are primarily rice producers.

For all stochastic production frontiers log-likelihood specifications tests were used to determine functional form and the presence of inefficiency effects. In all cases, standard OLS estimates are shown to be inappropriate and the functional form rejects a translog specification in favor of a more standard Cobb-Douglas production function. Tests on the cross-sectional data sets (the farm survey data set and the VHLSS data) also indicate that estimates of the stochastic frontiers using a random coefficients approach, allowing for 'non-neutral' shifts in the production frontier, following Kalirajan and Obwana (1994), resulted in little difference

in estimated coefficients, with the inefficiency term adequately represented by a truncated half-normal distribution. Frontier and inefficiency estimates are obtained using Frontier 4.1 (see Coelli et al.1998) for the provincial and VHLSS data and Stata 10 for the farm survey data, so that distributional assumptions on the technical inefficiency terms could be more easily examined.

# 4. Total factor productivity, terms of trade and net returns

TFP is a measure of outputs to inputs over any two time periods. Results for Vietnamese rice production are generated using Tornqvist quantity (and price) indexes given by

$$\ln Q_{st} = \sum_{i=1}^{N} \left( \frac{\omega_{is} + \omega_{it}}{2} \right) \left( \ln q_{it} - \ln q_{is} \right) \tag{4.1}$$

Or

$$\ln Q_{st} = \prod_{i=1}^{N} \left(\frac{q_{it}}{q_{is}}\right)^{\frac{\omega_{is} + \omega_{it}}{2}}$$
(4.2)

for N quantities q inputs or outputs (depending on context), periods s and t and weights

$$\omega_{is} = p_{is}q_{is} / \sum_{i=1}^{N} p_{is}q_{is} \tag{4.3}$$

for time period s; for example. TFP, for outputs y and inputs x is thus given by

$$\ln TFP_{is} = \frac{1}{2} \left( \omega_{is} + \omega_{it} \right) \left( \ln y_{it} - \ln y_{is} \right) - \frac{1}{2} \left( \upsilon_{is} + \upsilon_{it} \right) \left( \ln x_{it} - \ln x_{is} \right)$$
(4.4)

for input weighted shares i for periods s and t. For convenience, results are summarized across eight regions, as officially defined in Vietnam: the Red River Delta (RRD) (1), the Northeast (2), the Northwest (3); the North Central Coast (4), the South Central Coast (5), the Central Highlands (6), the Southeast (7) and the Mekong River Delta (MRD) (8). As mentioned, the RRD and the MRD are the major rice growing regions in the country. Region 7 is largely industrial, and regions 2, 3 and 6 are the poorest by conventional measures.

There is little doubt that the increase in rice production in Vietnam has been substantial, especially after the 'output share contracts' period (1981-87), or under the major land and market reforms (1981-94 and forward). Figures presented in Appendix 2 provide rich information on key trends in rice production in Vietnam in these periods. For the country as a whole, the indexed value of paddy rice output shows an average annual increase of 3.5 per cent, as a dotted linear trend (see Figure 1). The largest increases in rice output occur during the period of 'trade liberalization' (1987-94), and continue (virtually unabated) in the 'post- reform' period to 2006. However, trends in TFP vary markedly between regions in the country. Figure 2 shows that not only is TFP higher in the MRD, and especially so

compared to regions (2) to (7), but also that the growth in TFP is substantially larger in the MRD compared to the RRD and other regions. As a dotted annual trend the growth in TFP in the MRD is 4.42 per cent, while in the RRD it is 2.25 and in all other regions 1.36 per cent per year. This poor TFP performance is added concern in the poorest regions of the country (regions 2, 3 and 6), where the average annual increase in TFP is less than 1.3 per cent. In total, the MRD remains a stand-out in both the level and growth of TFP.

In all cases, except for the MRD, there is also evidence of a 'slow down' in productivity after the year 2000. This is an added problem, again, in poor regions (which generally do not have a natural advantage in rice production, or sufficient water resources for 'wet land' rice), but it is also a concern in the RRD, a major rice growing area, where farms remain relatively small and fragmented. Figures 3 and 4 build the terms of trade (TOT) in rice production. With the 'trade liberalization' reform process, the indexed price of rice increases (from the state-controlled low price in the 'communal period' to the partially controlled price during the output share contracts period) throughout 1989 to 1994 and beyond (see Figure 3). During the trade liberalization period all controls over the domestic price were removed, and prices rose rapidly. After 1996 the domestic price of rice partially reflects world prices for rice on international markets, and fluctuates accordingly.

As a product of both rapid increases in the output of rice and economic development, Figure 4 shows the (roughly uniform) increase in the indexed value of input prices over the period. Much of this is dominated by increases in the price of fertilizer (albeit with considerable volatility), due to the rapid increase in rice output, but farm wage rates also increase at an average annual rate of 1.44 per cent. The TOT, finally, is summarized in Figure 5, and clearly shows that except for the period from 1989 to 1998 (excluding 1993), the TOT has worsened relative to the 1985 starting point. If nothing else, this highlights the importance of TFP increases to partly offset this trend, since increases in productivity will generate proportionally more revenues for given input use. Figure 6 is the key graphic, in effect combining all price, quantity and productivity indexes together. It shows both the indexed value of paddy rice output (i.e., the indexed price multiplied by the indexed quantities of rice) and the indexed value of input expenditures (i.e., the indexed input prices multiplied by the indexed quantities of inputs). The gap or wedge between the two lines provides a measure of 'net income' in rice production over time.

For Vietnam as a whole, land and market reform generates a substantial wedge, or considerable increases in net income from 1989 to 2000, and especially so in the years 1992 to 1999. In 2001, both the domestic and international price of rice fall dramatically, and the wedge closes. The wedge for the years 1992-99 provides an essential story of economic development, and also coincides with well documented falls in the rural poverty rate in Vietnam. Increases in the price of price, output and productivity, on the one hand, and increases in the farm wage rate on the other, result in substantial increases in farm and rural income. It is roughly during this period, or from 1993 to 2004, as mentioned above, that the defined share of poor people in Vietnam "dropped by two thirds and approximately 30 million people were lifted out of poverty" (Hansen and Nguyen, 2007). Not all of this poverty reduction was due to rice production, of course, but given the large share of the population in rural areas and the predominance of rice production in rural agriculture, there is little doubt

that the reform and post-reform periods had a major impact on overall living standards. (See Glewwe et al. (2002) for the distributional effects of poverty reduction in Vietnam, based on early household surveys in 1993 and 1998, and Ravallion and van de Walle (2008) for recent welfare impacts of land reform).

Nevertheless, it is also clear that these gains are not shared equally across regions or the country. Figure 7 shows the indexed ratio of the value of revenues to the value of input costs for paddy rice production, for selected regions, as a measure of 'net returns'. Relative to the starting point, all regions due well from 1992 to 1999, but after 1999 both the RRD and all other regions fall (in some cases) far below the starting point. For the years 1999-2004, net returns are even less than one for areas outside of the MRD and RRD. Only the MRD does consistently well, both in terms of levels (compared to all other regions) and in terms of years with relatively large net returns.

# 5. Frontiers and efficiency

The importance of TFP levels and increases in resulting measures of net income highlight the importance of potential efficiency gains that accompany further land and market reform. The following sections use stochastic production frontiers and inefficiency models to isolate the key constraints on efficiency gains (as a component of TFP), and what policy measures might be most suitable.

#### 5.1 Stochastic frontiers and inefficiency

Stochastic production frontiers were first developed by Aigner, Lovell and Schmidt (1977) and Meeusen and van den Broeck (1977). The specification allows for a non-negative random component in the error term to generate a measure of technical inefficiency, or the ratio of actual to expected maximum output, given inputs and the existing technology. The idea can be readily applied to panel data, following Battese and Coelli (1995). Indexing firms by i = 1; 2; ...; n; the stochastic output frontier is given by

$$Y_{it} = f(Xit, \beta)e^{\nu it - uit}$$
(5.1)

for time t = 1; 2; ..., T, Yit output, Xit a (1x k) vector of inputs and b a (kx1) vector of parameters to be estimated. Cross-sectional estimates (as with the farm survey data below) drop the index for time, of course. As usual, the error term vit is assumed to be independently and identically distributed as  $N(0,|\sigma_{\nu}^2)$  and captures random variation in output due to factors beyond the control of firms. The error term uit captures firm-specific technical inefficiency in production, specified by

$$\mathbf{u}_{it} = \mathbf{z}_{it}\mathbf{d} + \mathbf{w}_{it} \tag{5.2}$$

for  $z_{it}$  a (1xm) vector of explanatory variables, a (mx1) vector of unknown coefficients and wit a random variable such that  $u_{it}$  is obtained by a non-negative truncation of Input variables may be included in both equations (5.1) and (5.2) as long as technical inefficiency effects are stochastic (see Battese and Coelli 1995). The condition that uit = 0 in equation (5.1) guarantees that all observations lie on or beneath the stochastic production frontier. A trend can also be included in equations (5.1) and (5.2) to capture time-variant effects. Following Battese and Corra (1977) and Battese and Coelli (1993), variance terms are parameterized by replacing  $\overline{\sigma_u^2}$  and  $\overline{\sigma_v^2}$  with  $\sigma_z^2 = |\sigma_u^2| + \sigma_v^2|$  and  $\gamma = \sigma_u^2/(\sigma_u^2 + \sigma_v^2)$ . The technical efficiency of the i-th firm in the t-th period for the basic case can be defined as

$$TE_{it} = \frac{E(Y_{it} \mid u_{it}, X_{it})}{E(Y_{it} \mid u_{it} = 0, X_{it})} = e^{-u_{it}} = \exp(-z_{it}\delta - w_{it})$$
(5.3)

and clearly must have a value between zero and one. The measure of technical efficiency is thus based on the conditional expectation given by equation (5.3), given the values of vit - uit evaluated at the maximum likelihood estimates of the parameters in the model, where the expected maximum value of Y<sub>it</sub> is conditional on  $u_{it} = 0$  (see Battese and Coelli, 1988). Efficiency can be calculated for each individual firm per year by

$$E[\exp(u_i) \mid v_i + u_i] = \frac{1 - \Phi(\alpha_a + \gamma(v_i + u_i) / \sigma_a)}{1 - \Phi(\gamma(v_i + u_i) / \sigma_a)} \exp\left[\gamma(v_i + u_i) + \sigma_a^2 / 2\right]$$
(5.4)

for  $\sigma_{\alpha} - \sqrt{r(1-r)\sigma^2}$  and  $\Phi(.)$  the density function of a standard normal random variable (Battese and Coelli 1988). The value of  $\gamma=0$  when there are no deviations in output due to inefficiency and  $\gamma=1$  implies that no deviations in output result from random effects, or variance in v.

#### 5.2 Econometric specification: provincial data (1990–99)

As mentioned, the first frontier estimate uses a provincial level data set from 1990-99. Summary statistics are reported in Table 1, which is presented, together with other tables, in Appendix 2. Note that all output and input measures (e.g., average farm size, labour, material inputs) are multiples of the number of crops per year. Generalized likelihood ratio tests are used to help confirm the functional form and specification. As a pre- test, the null hypothesis of a Cobb-Douglas form of the production function was tested against a general translog specification by setting the relevant parameters for squared and interaction terms in the translog form equal to zero. The resulting test statistic was  $\chi_{10}^2 = 9.4$  compared to a critical value of 19.7. A Cobb-Douglas functional form was thus selected. Accordingly, equation (5.1) for unbalanced panel data set (1991–1999) for i province and t time period is specified by a production function in log-linear form, or

$$\ln Y_{it} = \beta_0 + \beta_1 \ln K_{it} + \beta_2 \ln LAB_{it} + \beta_3 \ln LAN_{it} + \beta_4 \ln IN + \beta_5 T + v_{it} - u_{it}$$
(5.5)

where Y is the output of rice, K the stock of capital (a combined tractor and buffalo measure, in horsepower), LAB labour in working days, LAN total land under cultivation, I N material inputs (fertilizer, seed, insecticide) and T is a time trend.

The provincial 'farm-specific' factors used in the technical inefficiency model, or equation (5.6) below, are average farm size (SI Z E), the percent- age of rice land in which tractors are

used (T L); a variable indicating soil conditions (SOI L) as a binary variable for the main rice growing regions, or the MRD and the RRD, the number of threshing machines (M A) and the number of tractors (C A), so that

$$U_{it} = \delta_0 + \delta_1 \ln SIZE_{it} + \delta_2 \ln TL_{it} + \delta_3 SOIL_{it} + \delta_4 \ln MA_{it} + \delta_5 \ln CA_{it} + \omega_{it}$$
(5.6)

for  $\omega_{it} \sim N(0, \sigma_{it}^2)$  As mentioned, specific input variables can be included in equation (5.6) as along as technical inefficiency effects are stochastic and input variables in the production function are exogenous to the composite error term (Battese and Coelli 1995, and also, Forsund et al., 1980 and Schmidt and Lovell 1979).

Additional likelihood ratio (LR) tests are summarized in Table 2. Correct critical values from a mixed - squared distribution (at the 5 per cent level of significance) are drawn from Kodde and Palm (1986). The relevant test statistic is

$$LR = -2 \{ \ln[L(H_0) / L(H_1)] \} = -2 \{ \ln[L(H_0)] - \ln[L(H_1)] \}$$
(5.7)

where L(H<sub>0</sub>) and L(H<sub>1</sub>) are the values of the likelihood function under the null and alternative hypotheses respectively. The null hypothesis of a deterministic time trend in equation (5.6) is rejected. The null hypothesis that technical inefficiency effects are absent ( $\gamma = \delta_0 = \delta_1 = \delta_1 = \delta_2 = \delta_3 = \delta_4 = 0$ ) and that farm-specific effects do not influence technical inefficiencies ( $\delta_1 = \delta_1 = \delta_2 = \delta_3 = \delta_4 = 0$ ) in equation (5.6) are both rejected, as is  $\delta_0 = \delta_1 = \delta_1 = \delta_2 = \delta_3 = \delta_4 = 0$ . Finally, the null hypothesis that  $\gamma = \sigma_u^2/(\sigma_u^2 + \sigma_v^2) = 0$ , or that inefficiency effects are not stochastic, is rejected. All results indicate the stochastic effects and technical inefficiency matter and thus that traditional OLS estimates are not appropriate in this study. Additional LR tests reject non-constant returns to scale.

#### 5.3 Results for provincial data

Table 3 summarizes the results for the stochastic production frontier and inefficiency models. The coefficients on capital, labour, land and material inputs are 0.17, 0.13, 0.24 and 0.51 respectively. A time trend also tests as significant at 1.1 per cent per year. Results show that farms in the main rice growing regions, those with larger farm size, and farms with a higher proportion of rice land ploughed by tractor are more efficient. The size of the binary variable SOI L is perhaps the least surprising. Superior conditions for growing rice in the MRD and RRD, compared especially to the highlands in the northwest or central areas (regions 3 and 6), are clearly reflected in provincial-wide measures of efficiency throughout the sample period. The MRD in particular consistently ranks best in efficiency, year-to-year, and the efficiency measures for the MRD and RRD (taken together) are 11 to 13 per cent higher throughout than the average for Vietnam as a whole. (Detailed results for each province and region by year are available from the authors on request.) The policy requirement, in the past, that rice be produced in every province of Vietnam, and the current practical restrictions on land use, as detailed in section 2 above, thus appear unwarranted, at least in terms of the potential loss in efficiency that results from producing rice outside of the Mekong and Red River Deltas.

The coefficient for the proportion of rice land ploughed by tractor (TL) is also substantial at -0.35, and remains large even when testing with the MRD and RRD taken separately. An increase in number of tractors in rice fields clearly increases efficiency. The are two policy concerns here. First, and most importantly, the absence of credit markets and, in some cases, less than secure property rights, as discussed in section 2 above, undoubtedly limits the amount of tractors in rice production. Transactions costs on loans in rural areas are prohibitive and when granted are often for terms of only one year or less. Indeed, much of the increase in agricultural capital in the reform periods, and after, is due to accumulation from retained earnings, and not from borrowing (see Che et al. 2001 and Kompas 2004). Second, land policy itself often makes it difficult to employ tractors in rice fields. Plots are often small and butt directly to adjoining plots (separated only by a mound of dirt) and practical restrictions against farm size and impediments to land consolidation that would help ensure contiguous or non-fragmented plots (especially in the north), often make the use of tractors impractical, or at least not without a good deal of cooperation among farmers.

The coefficient of average farm size is smaller than might be expected, but still indicates that restrictions on farm size limit efficiency. However, this value rises considerably when estimating over the RRD and MRD (regions of comparable fertility) taken separately. In these truncated data sets, the co- efficient on average farm size in the technical inefficiency model is -2.7 in the RRD, while in the MRD it is -0.1, both significant at the one percent level. This is as expected. In the RRD, where restrictions on farm size are more severe and more broadly enforced, average farm size per crop is small at 0.4 hectare per farm, compared to 1.4 hectares per farm, per crop, in the MRD, so that efficiency gains are far from exhausted. The reason for smaller farm size in the RRD is usually attributed to a high population density in rural areas in the north combined with explicit legal and moral restrictions against 'excessive land accumulation', at least in practice. Moreover, although land can be leased for up to 20 years, there still are only limited markets for the exchange of land or land-leases (GSO (VHLSS) 2004). Thus, smaller farm size, the consequent smaller proportion of tractors used in rice fields, more restrictive land regulations and the slightly worse natural soil conditions in the RRD explain the lower levels of efficiency compared to the MRD.

The coefficient on the number of tractors, as opposed to the proportion of rice land ploughed by tractors, is positive for the simple reason that in most rural areas (other than the MRD and RRD) tractors are used for general transportation and for other industrial crops or small-scale industry. When testing for the MRD and RRD alone, where tractors are largely dedicated for rice production, the coefficient tests larger, at -0.18, as expected.

Finally, although average technical efficiency is low for Vietnam as a whole (59.2 percent) it is clear from Frontier 4.1 output that efficiency for rice farms in Vietnam and in the principal rice growing provinces (MRD and RRD) has been rising over time, albeit slowly, from roughly 55 to 65 per cent in Vietnam as a whole and 66 to 78 per cent for the principal rice growing areas. The gradual increase in the amount of capital (tractors and buffalo) is undoubtedly one of the key explanations for this trend. The only exception is the year 1994 where all areas experienced a fall in efficiency and especially so in the MRD and RRD. The reason for this fall appears to be partly due to Resolution 5 (Nguyen 1995), outlined first in 1993, which further re-divided farm size into smaller and non-contiguous plots, allocated now across prior family farm members, but perhaps mostly to the exceptional foods in that

year in most of the principal rice growing regions. Program output shows that previous technical efficiency measures were not recovered until three of four years later, or in 1997 for Vietnam as a whole and 1998 for the principal rice growing areas.

#### 5.4 Econometric specification: farm survey data (2004)

The second frontier estimate uses survey data obtained from a random se-lection of 338 farms producing rice from 32 communes across 8 provinces in the RRD and MRD, with a roughly equal split of farms and communes in each area. The survey was carried out from August to December 2004, with detailed collection of all rice output and input data, as well as farm specific characteristics. The main areas from which farms were selected in the MRD are Soc Trang, Tra Vinh, Vinh Long and Can Tho; and, in the RRD, from Ha Tay, Nam Dinh, Thai Binh and Nam Ha. Summary statistics are provided in Table 4. Log likelihood ratio tests (available from the authors on request) confirm the specification given by

 $\ln Y_{i} = \beta_{0} + \beta_{1} \ln K_{i} + \beta_{2} \ln LAB_{i} + \beta_{3} \ln LAN_{i} + \beta_{4} \ln F_{i} + \beta_{5} \ln P_{i} + \beta_{6} RRD_{i} + v_{i} - u_{i}$ (5.8)

for Y the output of paddy in kilograms, K capital in machinery hours, as the sum of hours a farm uses tractors in land preparation and transportation, pumps and threshing machines, LAB working days, as the sum of family and hired labour, LAN total land size in hectares, F kilograms of fertilizer used, P pesticides in kilograms and RRD a binary variable for Red River Delta rice farms. The inefficiency model in this case is

$$u_{i} = \delta_{0} + \delta_{1} SIZE_{i} + \delta_{2} PLOTS_{i} + \delta_{3} SOIL_{i} + \delta_{4} IRR_{i} + \delta_{5} ED_{i} + \omega_{i}$$
(5.9)

for SI Z E the amount of cultivated rice land (both leased and directly con- trolled by the household), P LOT S the number of plots of rice land in a given farm, as a proxy for land fragmentation and SOI L a measure of soil quality, ranked in decreasing order (from 1 to 6), based mainly on the chemical composition of the soil. I RR is a measure of water availability (natural and irrigated), ranked in decreasing order (from 1 to 4), obtained by asking farmers to rank their irrigation conditions, based on the level and difficulty of supplying water and drainage. The ranking from 1 to 4 is simply given by: very good, good, fair or poor. ED is the level of education of the farm decision maker, categorized by four levels: primary, secondary, high school and higher education.

#### 5.5 Results for farm survey data

Results for the farm survey data set are reported in Table 5. Given the nature of the data, the estimated input coefficients vary considerably with the results from the provincial data set. There are two reasons for this. First, the provincial data set is nation-wide, with large variations in rice production across 60 provinces, and especially so compared to farm survey data in the principal rice growing regions. Second, and perhaps more importantly, the measure of inputs in each data set is vastly different. For example, land in the farm survey data refers to the actual value of land cultivated, rather than a multiple of land cultivated over all rice crops during the course of a year, and capital is a value measure of all machines, rather

than a constructed measure of buffaloes and tractors. The value of the binary variable RRD in the stochastic production, in Table 5, alternatively, is straightforward and illustrates the advantages to growing rice in the south, compared to the north. This value is -0.184 and is consistent with the measured difference in TFP between the RRD and the MRD, illustrated in Figure 2.

Of particular interest, however, are the inefficiency results. Soil and irrigation are as expected, since they are ranked in decreasing order of quality, implying that higher quality soil and better irrigation increase efficiency, and it is clear that more educated farmers are also more efficient. The coefficients on SI Z E and P LOT S indicate the loss in efficiency from current land use practice, in a way that is not possible in the provincial data set, with provincial averages on farm size and no measure of plot numbers. The estimates clearly indicate that larger farms and farms with fewer plots are more efficient. The latter in particular indicates a potential issue with land fragmentation. Admittedly, simply counting the number of plots in a given farm is a crude indicator of fragmentation, since it lacks a measure of distance between plots or whether plots are contiguous or not, but it is also clear from the discussion in section 2 above that the more plots a farm has in Vietnam the more likely it is these plots are not contiguous. This is especially so in the north, where, as indicted above, small and highly fragmented farms predominate. Frontier estimates by Hung et al. (2007), on a smaller survey data set for 188 farms in the north only, near Hanoi in the RRD, in the year 2000, also show a negative relationship between the number of plots and farm efficiency.

#### 5.6 Econometric specification: VHLSS data (2004)

The third frontier estimate uses VHLSS data for 3,865 households in 2004 largely engaged in rice production (from a total of more than 9000 households surveyed). Although not literally a pure sample of rice producers, the rice output of the households in this sub-sample accounts for more than 75 per cent of total household annual crops in terms of quantity, and more than 78 per cent in terms of value. Summary statistics are listed in Table 6. Loglikelihood ratio tests (available from the authors on request) generate a specification for the stochastic production frontier of the form

$$\ln Y_i = \beta_0 + \beta_1 \ln LAN_i + \beta_2 \ln LAB_i + \beta_3 \ln HLAB_i + \beta_4 \ln M_i$$

$$+\beta_5 \ln MR_i + \beta_6 \ln F_i + \beta_7 \ln H_i + \beta_8 MRRD_i + v_i - u_i$$
(5.10)

with an inefficiency model given by

$$u_{i} = \delta_{0} + \delta_{1}PLOTS_{i} + \delta_{2}ED_{i} + \delta_{3}CERT_{i} + \delta_{4}QUAL_{i} + \delta_{5}EXT_{i} + \omega_{i}$$
(5.11)

for Y the output of paddy in kilograms, produced over the twelve months prior to the survey date, and LAN the amount of area (in square meters) that the household uses for annual crop production, regardless of its ownership. Labour comes from two sources: LAB household labour (in hours) and H LAB hired labour (in Vietnamese Dong). The values of machines (M), (i.e., tractors, tools and implements), rented machines (MR), fertilizer (F) and herbicide (H) are all measured in constant-value Vietnamese Dong. M RRD is a binary variable for rice produced in the MRD and RRD.

In the inefficiency model, PLOTS is the number of separate annual agricultural land plots in a household farm and ED is a rank for the education of the household head, given by numbers 0 to 5, or no schooling, primary, lower secondary, upper secondary, vocational training and college or university schooling. C ERT designates that a farm household holds a land certificate title (measured as a ratio of land under title to total land size), allowing for the sale or lease of all or some plots of land and QUAL is a measure of land quality, based on the land tax system, and generally correlated with the amount of soil nutrients and the proportion of soil serviced by natural or irrigated water. Annual agricultural land is classified into 6 categories which serve as the basis for the government to collect agricultural taxes. In equation (5.11), QUAL is specifically the ratio of the annual agricultural land area of the best two land types over total land holdings. EXT is a binary variable simply measured by a visit to an extension services office, attending meetings to seek advice or guidance on cultivation practices or raising livestock, or by being visited on farm by an extension staff officer.

#### 5.7 Results for VHLSS data

Results for the VHLSS data set are reported in Table 7. Estimated input coefficients are comparable to the results for the farm survey data set. The binary variable MRRD indicates the advantages of growing rice in the main delta areas. (A alternative specification, with MRRD in the technical inefficiency model, as in the estimates using the provincial data set above, generates similar results.) Results again indicate that increases in the number of plots (as a proxy for land fragmentation), decrease efficiency, and also that better educated farmers and higher quality soil (in terms of water availability and irrigation) increase efficiency across farms. In the VHLSS data land quality varies considerably and the mean is low (see Table 6), indicating that rice is produced in many areas without the natural advantage of water availability or irrigation. This is in sharp contrast to the results for the farm survey data set above, drawn mostly from farms in the MRD and RRD ,where water is not as much of an issue, and average land quality by this measure is much higher (see Table 4). Of added interest here are coefficient estimates on land use certificate and access to extension services. As mentioned, a proper land use certificate is essential not only for the ease of acquiring, selling or leasing land, but it also provides the often only ready source of collateral for farm loans. Those farms with a proper certificate are more efficient, as are those (nearly half the sample) that have access to agricultural extension services.

# 6. Closing Remarks

Extensive land and market reform in Vietnam has resulted in dramatic increases in rice output over the past thirty years. Results show that TFP increases considerably in the major rice growing areas (the Mekong and Red River Delta areas) during the early years of land and market reform, but with clear evidence of a productivity 'slow-down' since 2000 in all regions except the MRD. TFP in the MRD remains much higher than in the RRD, and TFP in other regions (and especially in poor areas) remains virtually unchanged throughout the entire period. Terms of trade and net returns are also favorable throughout the reform period, providing much of the explanation for increased incomes and poverty reduction during this time, but over- all performance has worsened considerably since 2001. The differences over time and by region speak directly to existing land use regulations and practices and suggest
calls for further land and market reform. In this regard, additional frontier and efficiency model estimates illustrate the remaining institutional and policy constraints, including existing restrictions on land consolidation and conversion and poorly developed markets for land and capital. Estimates show that larger and less land-fragmented farms, farms in the major rice growing areas, and those farms that are better irrigated, have a greater proportion of capital per unit of cultivated land, a clear property right or land use certificate and access to agricultural extension services are more efficient.

With this in mind, it seems clear that growing rice in every province, at least terms of a narrowly defined efficiency criteria, is inappropriate. Productivity and efficiency are both substantially larger in the Mekong and Red River delta areas, where rice production has a clear comparative advantage. This shows up repeatedly in both TFP and related measures, as well as in frontier and inefficiency models, in terms of both the magnitude of binary variables for these regions (and their effects on output or efficiency), and co- efficient estimates that measure the effects of irrigation or water availability on efficiency. Land policy (formal or in practice) which makes it difficult for land to be converted to other uses thus cannot be justified on these grounds. The same can be said for land consolidation. If farms that are larger and less fragmented are more efficient, practical restrictions on land size needs to be relaxed and a more active real estate market for land needs to be provided, encouraging low-cost and efficiency enhancing land transfers. A necessary and straightforward pre-requisite for this is well-defined land use certificates, covering every parcel of land, something that Vietnam has yet not been able to accomplish. This may also partly resolve problems with credit availability, as would a significant extension of the 20 year lease provisions on parcels of agricultural land. The current leases on land allocated in 1993 are indeed about to expire. Without a land use certificate, or with limited remaining tenure, it is difficult if not impossible to secure a loan, much less convert and consolidate land. The original land and market reforms, as dramatic as they were, have not gone far enough to secure property rights or provide sufficient or suitable markets for land and capital.

There are at least three issues are warrant further research. First, it would be useful to have a better defined measure of land fragmentation than used here, one that includes distance and a spatial representation of non- contiguous plots. Although the number of plots in a given farm is a useful proxy, and perhaps more than sufficient for Vietnam, a more refined index would be useful. This may also further clarify any potential interaction effects between fragmentation and land size on inefficiency. Second, the estimates would benefit from additional measures of rural services. The only variable used here, access to agricultural extension services, as a simple binary variable, matters greatly to efficiency, but so too must variables like rural infrastructure (e.g., roads, water rights and quarantine and surveillance measures) and specific cultivation practices, including the use of rice hybrids. Unfortunately, there is a lack of broad rice farm survey data to provide such estimates. Finally, and perhaps most importantly, there needs to be a clear investigation into the precise nature and cause of the thin or poorly developed agricultural land and credit markets in Vietnam, and what specific policies might be best to help resolve these constraints. It is undoubtedly the case that poorly defined property rights and inadequate land laws and practice matter greatly. Perhaps they are all that matter, but this, and the traverse from the current system to one that better serves rice farmers in Vietnam is still unclear.

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#### **APPENDIX 1: DATA SOURCES AND ADJUSTMENTS**

Data for TFP and related measures (1985-2006) and for the 1991-1991 balanced panel data set is drawn mainly from the SDAFF (Statistics Department of Agriculture, Forestry and Fisheries), 1991-2006, data sources obtained from the General Statistics Office of Vietnam (GSO), including VHLSS data, related project investigations, studies and reports by Vietnamese organizations, such as the State Planning Committee (SPC), the Ministry of Agriculture and Food Processing Industry (MAFI), the Ministry of Water Resources (MWR), the Department of Prices and Markets (DPM) (formally known as the State Department of Price (SDP)), and international organizations such as the World Bank and the Food and Agriculture Organization (FAO). The details of the structure of rice production (especially for the early data series) are extracted from the Surveys of Rice Production in the RRD and the MRD by Cantho University, funded by the International Rice Research Institute (see Nguyen Khiem (1995) and Vo (1995)).

It should be noted that from 1985-2002 there were 60 defined provinces in Vietnam based on the GSO statistics and administrative units. However, beginning in 2003, provinces were redefined into 64 provinces based on the GSO statistics and administrative units. In this study the 'new' provinces are aggregated into the previous provinces in the data set before 2003, for consistency. In particular, Can Tho, Dak Lak and Lai Chau refer to Can Tho and Hau Giang, Dak Lak and Dak Nong, and Lai Chau and Dien Bien provinces. Regions are as currently defined by the GSO. Primary data for 1985-1999 is obtained from Che et al. (2006) and Kompas (2004). The data set for 2000-02 is from Kompas (2004). In general, prices are measured in constant 2006 USD, and converted to Dong where appropriate. Data assembly and construction is as follows.

1. Output quantity and prices. Paddy output is drawn from SDAFF (2001, 2006) and the GSO (2008) under the category of 'production of paddy by province'. The time series of rice prices by province is computed from a number of sources, with recent data provided by the GSO. For the period 1985-2003 price data is based on Kompas (2004) and Che et al. (2006), most of which is obtained from the Department of Prices and Markets (DPM). A rice equivalent for output is chosen rather than rice output alone since in the same rice fields farmers usually overlap production with other short- term cereal crops, such as sweet potatoes and maize. There are multiple crops per year in many areas. Specific time series data for rice output is from SDAFF (1991) and MAFI (1991) for the period 1976-90, from SDAFF (2001) for 1990-93, GSO (1995) for 1994 and the SDAFF (2001) for 1995 to 1999. All measures were verified by alternative data sets contained in the SDAFF (2001) for the years 1975-1999. Updates were obtained from SDAFF (2006).

2. Land quantity and prices. The time series for 'planted area of paddy' is obtained from SDAFF (1991, 1992, 2001, 2006), SPC (1995) and the GSO (2008). The Vietnamese government divides the soil quality of land into seven levels and levies land tax depending on quality. A study by the World Bank (1994) distinguished the quality of soil into fwe levels in terms of cultivated area. Soil conditions and irrigation is generally much better in the RRD and MRD, compared to other regions (MWR 1994). Land-use price variables are defined as the cost of land use, or the average tax levies per one sown hectare in terms of value. The tax levies are required to be paid to government for the right of using land, which depend on land quality (by rank from type 1 to 5). Land taxes for rice land are based on the gross value

of rice production (SDAFF (2006)). It is assumed that the land price indexes are coincident with the gross value of rice area (as the multiple of rice output overall crops per year and the price of rice).

3. Labour quantity and prices. Data for the quantity of labour is obtained by multiplying average man-days worked per hectare by the number of hectares in a given rice cultivation area. The rice cultivated area is obtained from SDAFF (1991, 2001, 2006) and the GSO (2008). Total labour for rice production is calculated from total rice planted (in area) and average labour used for rice production per hectare. Average man-day working requirements includes work for land preparation, transplanting, weeding and harvesting, originally based on the survey of rice production by the Cantho University (1990-1995), as detailed in Nguyen Khiem (1995) and Vo (1995). The data on the price of labour for paddy production is estimated from average labour costs by the SRP by the Cantho University, DPM (1995, 2002 and 2005) and the VHLSS (2006), for the RRD and MRD. For 2003-06, the labour price variable is estimated using 2002 as a base year and the move- ment in the wage index for rice production, estimated as the average annual change in labour costs for rice cropping per hectare (SDAFF 2006).

4. Material inputs and prices. Materials for paddy production are largely composed of rice seeds and preparation, fertilizer and insecticide (of these fertilizer is the largest component, representing at least 30 to 40 per cent of total costs (DPM (1995, 2002 and 2005) and the GSO (VHLSS) (2006)). For the period prior to 2002 material input quantities are partly measured in terms of a 'urea-used equivalent', or total planted paddy area multiplied by the rate of fertilizer used per hectare per rice crop. The rates of fertilizer use for paddy production per hectare per rice crop are obtained from the SRP for the RRD and MRD and SDAFF (2001, 2006). This rate is adjusted in some non-principal rice growing provinces, based on reports provided by the GSO. For the period of 2000-02, material inputs are estimated as a multiple of the growth indexes of total fertilizer consumption used by Vietnam (FAO 2007), using 1999 as a base year, and the actual current fertilizer use by provinces in 1999 (provided from Kompas (2004)).

In Kompas (2004), material inputs include the nutrition content of all fertilizers (organic and chemical), insecticides and seeds. The conversion factor used to aggregate organic and chemical fertilizers is similar to that used by Tang (1980) and Sicular (1988). The amount of organic fertilizer for the rice industry is obtained from the total amount of organic fertilizer used for agriculture. Organic fertilizer for agriculture is assumed to be supplied from two main sources: night soil and large animal manure (buffaloes, cattle and pigs). Population-adjusted night-soil is estimated based on the size of the rural population (GSO 2008) multiplied by a rural utilization rate (0.9). The standard number of large animals equals the sum of buffaloes, cattle and pigs (GSO 2008), for which the weighted ratios are 1, 1 and 0.33 respectively. Organic fertilizer for rice production is obtained by multiplying the amount of organic fertilizer for agriculture with the weighted ratio between food grain area sown to the total sown area for cultivation. The chemical fertilizer data used for rice production is derived directly by multiplying the average amounts of chemical fertilizer used in the north (165.4 kg/ha) and the south (193 kg/ha) (drawn from the SRP) and the rice area in every province (SDAFF 2006). The data set for insecticides is constructed by multiplying the average use of insecticide per hectare in the year 1992, or 5.8 kg and 7.6 kg in the north and south, respectively, and the total rice area (SDAFF 2006). In a similar manner, the data for seeds are calculated from the average use of seeds per hectare, or 140 kg/ha and 240 kg/ ha in the north and south respectively, multiplied by the total rice area (GSO 2008). The time series for chemical fertilizer is calculated from the average amounts of chemical fertilizer used per hectare multiplied by cultivated area in each year (SDAFF 2001, 2006). The time series data for insecticides and seeds are calculated from the average use of insecticide and seeds per hectare (SDAFF 2001, 2006) multiplied by rice area for each year (SDAFF 2006). To verify, an updated measure of fertilizer (in terms of quantities) for 2003-2006 is estimated from the trend of average fertilizer use in the South East Asia (FAO 2007), using the 2002 as a base year.

5. Capital quantity and prices. The capital variable for 1985-1999 is based on Kompas (2004), following a similar approach to that used by McMillan et al. (1989), and assumes that the physical capital can be rep- resented by the capacity of tractors in combination with a buffalo equivalent measure. The conversion from the number of draught animals to the capacity of tractors is based on well-known observations in Pakistan (see Blomqvist 1986), indicating that a bullock-day (a pair of bullock working 8 hours) is approximately the same as a tractor-hour, with a typical tractor being between 15 and 25 horsepower. In the Vietnamese case, we assume that one cattle or buffalo-day is equivalent to roughly 0.6 bullock-days (or 14 hours of work by one pair of cattle or buffalo is roughly 8 hours of work by one bullock), with a typical tractor being 15 horsepower. The data sources for the capacity of tractors, number of buffaloes and cattle are provided from MAFI (1991, 1994), SDAFF (2001), and for recent series by SDAFF (2006) and the GSO (2008). The capital measure used for rice from 1985-1999 is drawn from (Kompas 2004). The capital measure used from 2000-02 is estimated from the planted area and the average capital cost for rice from DPM (2005). The updated capital quantity variable for 2003-2006 is estimated and verified from the trend of tractors used in the South East Asia (FAO 2007), using the 2002 as a base year. Capital prices for 1985-1999 are obtained from Che et al. (2001) and Kompas (2004), with additional details for the early part of this series provided in Che et al. (2006). An updated series is drawn from district level data obtained from the GSO and GSO (2008).

#### **APPENDIX 2. FIGURES AND TABLES**



Figure 1: Paddy rice output (indexed) in Vietnam (1985-2006). Average annual growth is rate by fitted linear trend is 3.5%

Figure 2: TFP (Total Factor Productivity) indexes for the Mekong River Delta (MRD), the Red River Delta (RRD) and all other regions (Other) for paddy rice production in Vietnam, 1985-2006. Average annual growth rate in TFP by fitted linear trend for the MRD is 4.42%, for the RRD is 2.15%, and for all other regions is 1.36%





Figure 3: Paddy rice ouput price index for Vietnam, 1985-2006.

Figure 4: Paddy rice input price index for Vietnam, 1985-2006. Average annual growth rate by fitted linear trend is 2.2%



Figure 5: TOT (Terms of Trade) indexes for rice production in Vietnam, as the ratio of indexed paddy prices to the indexed value of all input prices, 1985-2006. Base year is 1985



Figure 6: Net income measure or the indexed value of paddy rice output values (indexed output prices multiplied by indexed output quantities) and the indexed value of all input values (indexed input prices multiplied by indexed input quantities) in rice production in Vietnam, 1985-2006



Figure 7: Net returns in Vietnam, as the indexed ratio of revenues to input costs in paddy rice production, for Mekong River Delta (MRD), Red River Delta (RRD) and all other regions (Other), 1985-2006



### Table 1: Summary statistics for key variables in rice production for 60 provincesin Vietnam, 1991-99

Variables	Units	Average	St dev	Min	Max
Output (Y)	'000 tons	419.4	445.6	31.2	2,100.
Capital (K)	ʻ0000 horse power	11,591.2	13,732.7	325.4	79,9020.9
Labor (LAB)	ʻ000 working days	17,205.8	15,173.2	978.4	114,847.2
Land (LAN)	'000 hectare	120.9	106.7	12.2	514.3
Material inputs (IN)	<i>'000 tons</i>	44.1	30.5	3.9	145.0
Tractor number (CA)	units	1,455.4	2,717.6	2.0	31,123.0
Farm size (SIZE)	hectare/unit	1.8	1.4	0.2	4.5
Tractor proportion (TL)	percentage	0.4	0.3	0	1.0
Threshing machines (MA)	units	2,325.2	6,419.4	0.8	69,541.0

## Table 2: Generalized likelihood ratio tests, parameter restrictions for the stochastic production frontier and technical inefficiency models (equations 5.5 and 5.6)

Null hypothesis	χ²-statistic for Regression 1	$\chi^2$ 0.99-value	Decision
$\gamma = \delta_0 = \delta_1 = \delta_2 = \delta_3 = \delta_4 = \delta_5 = 0$	51.62	19.38	reject H <sub>0</sub>
γ=0	23.54	8.27	reject H0
$\delta_0 = \delta_1 = \delta_2 = \delta_3 = \delta_4 = \delta_5 = 0$	411.4	17.75	reject H <sub>0</sub>
$\delta_1 = \delta_2 = \delta_3 = \delta_4 = \delta_5 = 0$	139.7	16.07	reject H <sub>0</sub>

Note: The critical values for the hypotheses are obtained from Table 1 of Kodde and Palm (1986).

# Table 3: Parameter estimates of the stochastic production frontier and technical inefficiency models for Vietnam, provincial data, for 540 observations, 1991-99 (equations 5.5 and 5.6)

		Coefficient	T-ratio
Stochastic production frontier model			
Constant		0.40	2.30
(2 + 1/W)/(1 + 1)	(0.17)	0.15	0.50
Capital (K) (In)	(0, 02)	0.17	8.78
Labor (LAB) (ln)	(0.02)	0.13	4 07
	(0.03)	0.10	1.07
Land (LAN) (ln)		0.24	6.94
	(0.04)		
Material inputs (IN) (ln)		0.51	1.61
$T_{\rm max}(T)$	(0.03)	0.011	4.00
11me (1)	(0, 002)	0.011	4.88
Technical inefficiency model	(0.002)		
· · · ·		0.72	( 10
Constant		(0.63)	6.10
Average farm size (SIZE) (ln)		-0.03	2.60
		(0.01)	2.00
Tractor used proportion (TL) (ln)		-0.35	4.46
		(0.08)	
Natural conditions (SOIL)		-0.29	7.45
		(0.04)	1.54
Ihreshing machine (MA) (In)		-0.01	1.54
		(0.01)	

	Coefficient	T-ratio
Tractor number (CA) (ln)	0.04 (0.02)	2.81
asymptotic standard errors.		
Sigma-squared	0.07	11.74
Gamma	0.94	18.84
Log-likelihood	9.87	
Mean Efficiency (per cent)		59.2

Notes: The coefficient on material inputs is significant at the .05 level, and on threshing machines at the .10 level. All other coefficients except labour are significant at the .01 level. Numbers in parentheses are asymptotic standard errors.

### Table 4: Summary statistics for key variables in paddy rice production for the farmsurvey data set, 2004

Variables	Units	Mean	Std dev	Min	Max
Output (Y)	kg	10320.86	12483.51	690	105593
Land (LAN)	ha	0.915	0.9855	0.06	7.3
Labour (LAB)	man days	155.89	91.26	32	583.5
Capital (K)	hours	35.85	36.72	3.51	272.36
Fertilizer (F)	kg	814.08	610.05	73	5000
Pesticides (P)	kg	14.69	11.88	1.39	123.65
Soil Quality (SOIL)	rank	2.72	1.07	1	5
Irrigation (IRR)	rank	2.62	0.59	1	4
Farm Size (SIZE)	ha	0.915	0.9855	0.06	7.3
Plots (PLOTS)	unit	3.36	2.55	1	14
Education (ED)	level	2	0.639	1	4

## Table 5: Parameter estimates of the stochastic production frontier and technicalinefficiency models for the farm survey data, for 388 observations,2004 (equations 5.8 and 5.9)

	Coefficient		T-ratio
Stochastic production frontier model			
Constant	7.53 (0.233)	32.34	
Capital (K) (ln)	0.116 (0.028)		4.09
Labor (LAB) (ln)	0.023 (0.033)		0.69
Land (LAN) (ln)	0.668 (0.037)	17.65	
Fertilizer (F) (ln)	0.182 (0.029)		6.21
Pesticide (P) (ln)	0.049 (0.015)		3.14
RRD	-0.185 (0.031)	-5.89	
Technical inefficiency model			
Constant	-7.27 (0.932)		-0.665
Land Size (SIZE)	3.17 (0.209)		-7.80
Plots (PLOTS)	0.150 (0.050)		2.99
Soil (SOIL)	0.763 (0.145)		5.25
Irrigation (IRR)	0.831 (0.011)		3.55
Education (ED)	-0.689 (0.229)		-3.00
Sigma-squared	0.013		9.7
Gamma	0.98		16.90
Log-likelihood	264.3		
Mean Efficiency (per cent)		64.3	

Notes: All coefficients except labour are significant at the .01 level. Numbers in parentheses are asymptotic standard errors.

### Table 6: Summary statistics for key variables in paddy rice production for the VHLSS survey data set, 2004

Variables	Units	Mean	Min	Max
Paddy rice output (Y)	kg	3,733	75	120,75
Land (LAN)	m2	5,447	165	100,0000
Labour (LAB)	hours	2509	0	16,048
Labour hired (HLAB)	000 VND	322	0	36,000
Machines (M)	000 VND	70,998	0	3,000,000
Machines rented (MR)	000 VND	625	0	18,400
Fertilizer (F)	000 VND	1,159	0	34,000
Herbicide (H)	000 VND	375	0	19,800
Mekong and Red River Deltas (MRRD)	yes = 1	0.41	0	1
Number of plots (PLOTS)	number	4.26	1	30
Land quality (QUAL)	ratio	0.1	0	1
Land with LUC (CERT)	ratio	0.79	0	1
Household head education (ED) (1 = no school; 5 = college or university)	level	1.33	0	5
Access to extension services (EXT)	yes = 1	0.48	0	1

#### Table 7: Parameter estimates of the stochastic production frontier and technical inefficiency models for VHLSS data set, for 3,865 observations, 2004 (equations 5.10 and 5.11)

	Coefficient	T-ratio
Stochastic production frontier model		
Constant	21.5 (0.07)	1.51
Land (LAN) (ln)	0.507 (0.009)	58.31
Labour (LAB) (ln)	0.028 (0.007)	4.38
Hired labour (HLAB) (ln)	0.027 (0.003)	10.68
Machines (M) (ln)	0.004 (0.001)	3.55
Machines rented (MR) (ln)	0.096 <i>0.005</i>	18.29
Fertilizer (F) (ln)	0.161 (0.006)	26.04
Herbicide (H) (ln)	0.092 (0.005)	18.44
MRD and RRD (MRRD)	0.15 (0.014)	11.13
Technical inefficiency model		
Constant	-4.54 (1.045)	-4.34
Number of plots (PLOTS)	0.105 (0.018)	5.75
Household head education (ED)	-0.692 (0.118)	-5.84
Ratio of land with LUC (CERT)	-1.092 (0.181)	-6.04
Land quality (QUAL)	-1.525 (0.240)	-6.36
Access to extension services (EXT)	-0.63 (0.106)	-5.98
Gamma	0.958	119.2
Sigma-squared	1.881	5.6
Log-likelihood	-1705.5	
Mean Efficiency (per cent)	78.	8

Notes: All coefficients are significant at the .01 level. Numbers in parentheses are asymptotic standard errors.

5

### A 'Bottom-up' Regional CGE Model for Vietnam: The Effects of Rice Export Policy on Regional Income, Prices and the Poor<sup>1</sup>

Tom Kompas, Pham Van Ha Che Tuong Nhu Nguyen Thi Minh Hoa Bui Trinh

#### **1. Introduction**

The year 2008 witnessed high increases in the prices of many commodities in the world, including dramatic increases in the price of rice. Increasing from US\$ 400 per ton in January 2008 to roughly US\$ 1000 per ton in May 2008, movements in international rice prices caused chaos in both import and export countries. Some rice exporters including Vietnam placed an export ban on rice to ensure domestic food security. As the second biggest rice exporter in the world, the increase in rice prices is potentially beneficial to Vietnam. However, rice also plays an important role in the living standards of Vietnamese households, both as producers and consumers. Rice contributes nearly 69 percent of calorie intake in Vietnam as a whole, and 71 percent in rural areas and 61 percent in urban areas (Vu and Glewwe, 2008). On the other hand, half of the households produce rice (Vu and Glewwe, 2008), which makes it hard to generalize on the relative benefits of increases in the price of rice. Net producers clearly benefit, but those that mostly consume rice are worse off.

The rice export ban applied in Vietnam generated considerable debate among various stakeholders. We contribute to this debate by simulating the export ban together with three

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other policy scenarios in a bottom-up eight-region Computable General Equilibrium Model (CGE) model, with data from the 2005 input-output table. We then simulate the results on individual households using the 2006 Vietnamese Household Living Standard Survey (VHLSS 2006). Our results show that although there were limited 'pro-poor' outcomes, the overall effect of the rice export quotas resulted in falls total rural savings as measured by the difference in total income less total production cost and consumption of rice.

The structure of the paper is as follows. Section 2 provides the background and reviews existing studies in Vietnam that have tried to estimate the welfare impact of government policies in rice market. Section 3 describes the methods and data. The results from the CGE model and micro-simulation on household data are discussed in section 4. Section 5 offer concluding remarks.

#### 2. Background

Vietnam has made remarkable progress in the rice production in the last thirty years, moving from being a large importer of rice from 1976-80, to now the second largest exporter of rice in the world. About 7.5 million hectares of land is under rice cultivation, producing approximately 39 million tonnes a year. More than 50% of the rice output is produced by the Mekong River Delta and more than 90% of exported rice comes from this region. As recent as the year 2008, Vietnam rice exports reached 5 million tonnes of rice with export revenue of about 3 billion USD, contributing roughly 3 per cent to the GDP of Vietnam.

There have been many policy changes over the last thirty years in the rice sector. Most important are the pervasive land and market reforms in agriculture, which moved the system of rice production from commune-based public ownership and control to one with effective private property rights over land and farm assets, competitive domestic markets and individual decision making over a wide range of agricultural activities (Kompas et al. 2009). The outstanding successes in increasing the rice production aside, the Vietnamese rice market is characterized by many constraints and concerns. Paddy markets, for example, especially between the North and the South, are not fully integrated (Baulch et al, 2008). Although the quota regime on rice export was removed in 2001, the government still monitors rice exports by setting the export target for each year based on the production of the previous year, with adjustment if needed during the year. There are also a number of bureaucratic procedures that export enterprises need to go through in order to export rice, such as price getting approval from Vietnam Food Association on export prices on the export contract.

The year 2008 provides a challenge to the government's approach in monitoring rice exports. Faced with the rapid increase in the international rice prices from US\$ 400 in January 2008 to roughly US\$ 600 in March, and overall high inflation in the domestic economy of food prices (18.9 percent in 2007 and 14.5 percent in the first three months of 2008), the Government banned signing new export contracts from the 25th March until the end of May 2008. In July 21, 2008, an export tax was imposed on rice sold at \$800 a tonne or more. When the tax went into effect on Aug. 15, prices for Vietnamese '5% broken rice', the highest quality grain among the country's common grades for export, had fallen to \$550 per tonne, free-on-board basis. The export tax was abolished on December 19, 2008 to help boost domestic supply.

A temporarily ban on rice exports versus full trade liberalization, taking full advantage of high prices, implies a trade-off. On one hand, liberalization leads to further increases in domestic rice prices, which result in increases in input costs for all producers since wages, especially unskilled labour and labour involved in small manufacturing, are often correlated with the price of rice. The cost of rice consumers also increases, of course. On the other hand, increases in rice prices also increase profit for net rice producers, most of whom are the poor. As seen in Figure 1, much of the potential gain from the rice price surge was foregone as the ban on export was in effect from March until the end of May 2008.



#### Figure 1. Vietnam domestic retail rice price and free-on-board price (USD/ton)

Sources: Data on retail rice prices of Mekong River Delta from General Statistics Office; Data on free on board rice price of Vietnam from FAOSTAT Database, 2008. FAO, Rome. 22 Sep 2008.

A number of researchers have explored the impact of trade liberalization in the rice sector on household welfare. Minot and Goletti (1998) use a multi-market spatial equilibrium model, which employs data from the International Food Policy Research Institute surveys in 1994-1995, in combination with the survey data from the 1992/1993 Vietnamese Living Standard Survey, to show that although rice export liberalization would increase rice prices and exacerbate regional inequality, it would also increase average real income and slightly reduce the incidence and severity of poverty. Nielson (2003) uses a General Trade Policy Analysis Project (GTAP) model, with data from the Vietnam Input Output Table 1997, and shows that an export quota has been a binding and restrictive policy that has kept both Vietnam rice production and exports well below their maximum potential amounts.

Although the rice export quota has been removed since 2001, we are not aware of any published studies that measure the effect of export policy in Vietnam and its welfare impact on households, apart from our recent study. Most of the studies on impact of trade liberalization

focus on Vietnam's trade agreements and accession to the World Trade Organization. Using a bottom-up eight-region Computable General Equilibrium Model (CGE) with data from the input output table for the year 2005, we simulate the impact of export ban with and without full rice domestic market integration, together with two other policy scenarios, which include free trade and a trade tariff. We then simulate those results generated from the CGE model using the 2006 Vietnamese Household Living Standard Survey (VHLSS2006) to measure the welfare impact of those policy scenarios on households who are both rice producers and consumers.

#### 3. Methodology

#### 3.1 'Bottom-up' Regional CGE model for Vietnam

The bottom-up multi-regional General Equilibrium Model (CGE) for Vietnamese economy is developed in this paper based on ORANI model for Australian Economy (Horridge 2003). To have bottom-up and multi-regional characteristics, the General Equilibrium Model for Vietnamese economy is a combination of eight ORANI models (representing 8 regions in Vietnam), with full regional dimension.

The model has 28 industries (I) which produce 28 commodities (C) (See Appendix 1); 8 regions with four sectors, which include households (urban and rural), the government, investors and the oreign sector (exports and imports). There are two types of labour skill designations in the model, or skilled and unskilled labour. The taxes in the model are comprised of excise, value-added taxes and duties. The margins include wholesale and retail charges and transportation charges.

The model has seven structural equations. The production equation is assumed to exhibit a Constant Elasticity Substitution (CES) in labour (CES in skilled and unskilled), land and capital to generate Primary Inputs; CES in goods from regions to generate Intermediate Products; and Leontief in Intermediate Products and Primary Factors to generate output (See Appendix 2). We assume that this is short-run model with fixed capital stocks as our analysis focuses on the short-run impact of the temporary rice export ban.

The household demand equation is also CES in two composite commodities, made up of two sets of 28 goods from each region and final consumption goods, taken separately (see Appendix 3), and combined as Stone-Geary in utility. Parameter values for household demand are drawn from the Vietnamese Monash (VIPAG) model. The investment demand equation is CES in two composite commodities and combined as Leontief in capital good outputs (see Appendix 4). Export demand is assumed to be specified as follows:

$$Export(C,R) = QF(C,R) \left[ \frac{P(C,R)}{e * PF(C,R)} \right]^{EXP\_ELAST(C,R)}$$

where *Export* is the real export volume of good C in region R; QF and PF are the quantity and price shift parameters of good C in region R; P is the export price;  $EXP_{-}$ 

ELAST(c,r) is the elasticity of export demand of good *C* in region *R*; and *e* is the exchange rate. For the export demand schedule to be downward slopping,  $EXP\_ELAST(c,r)$  must be negative in the model.

Government expenditure and composition is held fixed as is the demand for inventories. Margins (with the exception of inventory demand) are assumed and the usual market clearing conditions are imposed.

#### 3.2. Micro simulation

As the household can be both a consumer or producer of rice or both, the price change affects not only consumption but also income and production. To measure the impact of various policy scenarios, we use a metric of household savings from rice production as an indicator of the household welfare, simply given by a measure of rice household saving, or the difference between revenue in rice production less the cost of rice production and the consumption of rice Household savings before the price shock is used as the benchmark and compared across all policy scenarios modelled in the CGE framework. The household is considered to be 'better off' if it has more savings after a resulting price shock.

#### 3.3. Data

The paper uses the 8-region Inter-regional Input Output table (2005) for Vietnam's economy (VIRIO 2005) to constructing the CGE model. It covers eight regions including the Red River Delta, North East, North West, North Central, South Central, Central Highlands, Southeast, and Mekong Delta. The VIRIO 2005 has 28 industries (I) which produce 28 commodities (C) which include Paddy, Other crops, Livestock and Poultry, Forestry, Fish Farming, Fisheries, Oil and Gas, Mining, Processed Seafood, Processed Rice, Other Agricultural Processing, Textiles, Paper, Wood, Rubber, Non-Metallic Mineral Products, Transport Equipment, Metal Products, Other Manufacturing, Electricity and Water, Construction, Transport (Margin), Communication, Trade (Margin), Financial services, Public Administration, Hotels and Restaurants, and Other Services.

For the simulation exercise, the Vietnam Household Living Standard Survey 2006 (2006 VHLSS) is used to simulate various shocks generated from the Computable General Equilibrium Model (CGE model). There are two reasons for choosing the 2006 VHLSS for this micro simulation exercise. First, this is the latest Household Living Standard Survey. Second, the survey time, which was in May and September 2006, is the closest to the time frame of the Intra-regional Input Output Tables 2005 (IO Tables 2005) for Vietnam, also the latest or most recent IO Tables. Hence, there is strong comparability between the macro and micro data.

The 2006 VHLSS was carried out by the General Statistics Office in Vietnam. The sample of 2006 VHLSS was selected to represent the whole country (urban/rural), 8 regions (urban/rural) and provinces and cities. A total of 45,945 household interviews were conducted for the 2006 VHLSS, and income and expenditure data were gathered for 9,189 of them, or roughly 0.05 per cent of all households in Vietnam (GSO, 2006). This report relies on income and expenditure data of these 9,189 households as the income data of the remaining households is not yet released to public. In this report, we use the term '2006 VHLSS' to refer to the sample of 9,189 households.

#### 3.4. Policy scenario design

The key exogenous shock in the model is a 30 percent increase in rice export prices as the result of an upward shift of the world demand schedule for rice. Four policy scenarios are implemented to trace the effect of the shock and its impact on Vietnam's economy. In the first scenario, Vietnam allows free exports so the domestic prices go up in parallel with the world price. In the second scenario, Vietnam sets an administrative rice export limit which helps control the increase in domestic prices. This was the actual policy action taken by the Government of Vietnam in March 2008.

The third policy scenario is trade but with export limits. In this case, the government fails to keep the domestic rice price low as the market is not fully integrated and rice from surplus areas does not reach the areas with supply shortage. This scenario is designed as having an administrative rice export limit and a producer tax of 15 percent. In a sense, this is case closest to reality as the Government of Vietnam banned the export of rice for a few months and, since the Vietnamese domestic market is fragmented, rice did not shift from the rice-surplus region of the Mekong River Delta to other regions. The last scenario is the case where the Government of Vietnam imposes a 5 percent tariff on rice exportation.

#### 4. Results and discussion

#### 4.1 Model results

At the national level, the increase in international rice price does not have a large impact on Vietnamese economy (see Table 1), as the whole, with the change in GDP from a reduction of 0.37 percent under the scenario of export limits and producer tax to increase of 0.6 percent under the scenario of export limits alone. The free trade scenario results in marginal reduction of 0.06 percent of GDP while the tariff leads to as small 0.01 percent increase in GDP. Despite the fact that the economy gains from higher price on its rice export, the surge in domestic price of rice have a counter-productive effect, which is the largest in the case of export limit and producer tax resulting in a shrinkage of 0.37 percent of the GDP.

	Free trade	Export limit	Export limit & producer tax 15 %	Export Tariff 5%
Country GDP growth	-0.06	0.6	-0.37	0.01

#### Table 1. GDP growth under different scenarios (percentage change)

At the sub-national level, export expands substantially under free trade and export tariffs, while the domestic price varies under different scenarios. As seen in Table 2, the domestic price of rice rises highest in the case of free trade, followed by the case of an export tariff. The objective of controlling the domestic price of the Government can be best achieved in the case of export limit. However, as the domestic market is likely fragmented (see Baulch et al., 2007), the scenario of export limit and producer tax is more likely to occur.

Regions	Free trade	Export limit	Export limit & producer tax 15 %	Export Tariff 5%
Red River Delta	27.64	-7.32	12.32	21.58
North East	23.94	-4.70	13.62	18.06
North West	26.10	-4.02	13.68	20.93
North Central Coast	26.16	-4.45	13.57	20.21
South Central Coast	24.52	-4.14	13.84	18.64
Central Highland	26.78	-5.15	12.70	21.69
South East	32.02	-18.27	6.49	25.75
Mekong River Delta	34.24	-16.8	6.41	27.97

#### Table 2. Percentage Change in Regional Domestic Rice Prices by Scenario

The gain from international rice price surge does not spread evenly across the regions (see Table 3). The Mekong River Delta ranks the first in benefiting from the rice price rise with its GDP increasing most or shrinking least in all scenarios. Despite being the country's the second largest rice producer, the South East region does not have a comparative advantage in rice production, and higher rice prices do not effect this region greatly. Among policy measures, export tariff appears to be the least distortionary with regional GDP growth moving in line with the case of free trade. The export limit and producer tax hurts all regions while the export limit narrows the regional gap in GDP growth, harming most the Mekong River Delta and favouring the North West, Central Highlands and South East regions.

Regions	Free trade	Export limit	Export limit & producer tax 15 %	Export Tariff 5%
Red River Delta	0.05	0.41	-0.62	0.06
North East	-0.25	0.26	-0.72	-0.22
North West	-0.91	0.78	-0.89	-0.72
North Central Coast	0.12	0.29	-0.59	0.1
South Central Coast	-0.25	0.15	-0.56	-0.18
Central Highland	-1.3	0.82	-0.54	-1.06
South East	-0.88	0.6	-0.22	-0.66
Mekong River Delta	2.17	1.07	-0.18	1.96

#### Table 3. Regional effect of price change on GDP by scenario (percentage change)

The sub-national distribution pattern can be explained by two main regional features. The first one is the share of paddy and processed rice in the regional GDP. As seen in Figure 2, all regions except the Northwest and Central Highlands 'export' rice, with the Mekong Delta by far the largest international exporter. While the Red River Delta and the North Central Coast regions also substantially benefit from the rice price increase, the South East region is worse off as its paddy's and processed rice's share in its GDP is the lowest among all regions.



### Figure 2. Share of Paddy Production and Rice Processing Industries in Regional GDP (percentage)

Second, the industrial employment structure also matters (see Tables 4a and 4b). Because the wage rate in the model is indexed with the consumption price index, the nominal wage increases in all regions with an increase in the price of rice. Therefore, industries with higher output prices such as Paddy, Processed Rice, or Live Poultry can have higher labor employment and hence a higher output. On other hand, regions with lower share of those industries will have lower average labour employment. The South East region, for example, with low agricultural sector share in its GDP witnesses its manufacturing sector suffers most from higher labour cost.

Regions	Free trade	Export limit	Export limit & producer tax 15%	Export Tariff 5%
Red River Delta	4.93	-1.06	0.99	3.91
North East	4.74	-1.26	1.17	3.68
North West	6.5	-1.9	1.59	5.25
North Central Coast	5.12	-1.09	1.1	4.05
South Central Coast	3.17	-0.43	0.95	2.44
Central Highland	4.5	-1.6	0.82	3.68
South East	2.31	-0.91	0.36	1.87
Mekong River Delta	8.37	-1.33	0.75	6.91

### Table 4a. The Effect of a Rice Price Increase on Regional Wages by Scenario(percentage change)

Regions	Free trade		Export limit		Export limit & producer tax 15%		Export Tariff 5%	
	Skilled	Unskilled	Skilled	Unskilled	Skilled	Unskilled	Skilled	Unskilled
Red River Delta	-0.75	1.44	0.63	0.58	-0.83	-0.93	-0.61	1.17
North East	-0.92	0.31	0.41	0.34	-0.88	-1.05	-0.76	0.22
North West	-1.91	-0.84	1.06	1.13	-1.06	-1.19	-1.54	-0.66
North Central Coast	-0.45	1.06	0.4	0.4	-0.73	-0.86	-0.38	0.85
South Central Coast	-0.69	0.33	0.22	0.19	-0.76	-0.8	-0.54	0.26
Central Highland	-1.8	-1.53	1.04	1.2	-0.67	-0.74	-1.47	-1.25
South East	-1.5	-1.31	0.99	1.02	-0.36	-0.37	-1.21	-1.05
Mekong River Delta	2.16	5.17	1.56	1.73	-0.34	-0.28	1.84	4.34

### Table 4b. The Effect of a Rice Price Increase on Regional Employment by Scenario(percentage change)

Despite the gain in output price, rural household suffer more than urban household in term of consumer price in all scenarios except the second, where the domestic price of rice do not moves with international prices (see Table 5). Furthermore, in all cases when the domestic price of rice is higher, the North West regional households have to buy a more expensive consumption bundle (with higher rice prices) than other regions. This is because North West is a remote region. Higher margin costs (trade and transportation) are thus applied to consumption goods in the region. Compared with the growth in GDP, in Table 5, we can see that households, in particular rural households, suffer in all cases except when the government intervention can prevent the domestic price of rice from increasing in line with international prices.

	Free trade		Export limit		Export limit & producer tax 15%		Export Tariff 5%	
	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural
Red River Delta	3.14	5.48	-0.87	-1.66	0.92	1.79	2.49	4.34
North East	3.27	5.39	-0.96	-1.64	1.05	1.95	2.54	4.2
North West	4.58	7.83	-1.5	-2.71	1.34	2.43	3.69	6.31
North Central Coast	3.29	5.19	-0.84	-1.43	0.96	1.69	2.6	4.1
South Central Coast	2.22	3.9	-0.36	-0.66	0.85	1.76	1.72	3
Central Highland	3.61	6.42	-1.4	-2.65	0.77	1.46	2.94	5.24
South East	2.16	4.44	-0.93	-2.2	0.37	0.83	1.75	3.59
Mekong River Delta	4.17	6.78	-1.29	-2.58	0.56	1.05	3.44	5.57

### Table 5. The Effect of a Rice Price Increase on the CPI by Scenario, Urban and Rural(percentage change)

#### 4.2 Micro-simulation results:

For the micro-simulation results, household savings under the four policy scenarios are compared with the benchmark, which is the household saving before the shock. This is a short run analysis where it is assumed that there is no change in both supply and demand due to price changes.

Figure 3 presents the proportion of households 'better off' by quintiles under four scenarios by quintile and urban-rural. 'Better-off' simply means more saving per person (i.e. it could be as little as 1 VND or more per person). The left panel shows the gain from the increase in rice prices is uniform under the free trade and export tariff. The export limit appears to be the most pro-poor scenario with more poor than rich people benefitting from the gain. In contrast, the pro-rich pattern is shown under the export limit with producer tax. This also appears to be the worst policy choice as the fewest people can enjoy gains. On the lower panel, rural dwellers are seen better off compared to their urban counterparts in all cases except for the export limit with a producer tax.



Figure 3. Proportion of households 'better off' by quintile and urban-rural

Source: Own calculation using the 2006 VHLSS

Looking at the magnitude of the change in the household yearly saving per capita compared with the benchmark household yearly saving per capita before the shock, the urban dwellers in general also suffer much more than their counterparts in the rural areas under all scenarios, which is as expected as most of them are net rice buyers. As seen in Figure 4, which represents the change in household yearly per capita saving by regions for samples in the rural and urban areas, export limits with producer tax hurts all urban and rural areas. Though export limit has positive effect on all rural and most of the urban areas, its magnitude is relatively small. Free trade is the most beneficial policy measure followed by the export tariff to the rural areas (see Figure 5).

### Figure 4. Change in household yearly per capita saving against their benchmarks by regions





Source: Own calculation using the 2006 VHLSS

### Figure 5. Change in household yearly per capita saving against their benchmarks by quintile





Source: Own calculation using the 2006 VHLSS

In fact, the urban sample has 49, 32 and 26 per cent of urban households from the poorest, near the poorest and the middle groups, respectively, who have income from planting paddy. The two poorest urban groups have quite similar pattern of income with about 35 per cent is from wage, about 10 per cent from providing services, 3 per cent from paddy, 4 per cent from other crops and 3 per cent from livestock. These items increased most under the free trade and export tariff scenarios. The middle group earned about 24 per cent income from their business in ferrous mental and products and 21 per cent from wage, which have their values increased by 2.7 and 5 per cent, respectively under free trade. The near-the-richest group, on the other hand, generates only 18 per cent and 17 per cent income from their business ferrous mental and products and under the richest group earned about 59 per cent of their income from their business in non-metallic mineral products, which has price increased by 3.6% under free trade.

From the consumption side, the processed rice accounts about 27 per cent of the poorest group compared with 19 and 14 per cent, respectively for the near the poorest and the middle groups in urban areas. In the contrast, the richest group spends only about 5 per cent on rice in their consumption bundle compared with 9 per cent of the near the richest group. This explains why the near the richest group is the worst off under the free trade, though the magnitude is very small in urban area. Under the trade limit, the richest group is hurt most as this group consumed many products which are not reduced much under this scenario such as construction materials, gasoline and restaurants.

For the rural households, as it can be seen in Figure 5 that the impacts on the per capita saving under free trade and export tariff have the same pattern with smaller magnitude for the latter scenario. It is not surprising to see the Mekong River Delta, which produces about 13 per cent of the paddy and 10 per cent of the processed rice of Vietnam, benefits most under these two scenarios with per capita saving rising by 793,000 VND under the free trade and 587,000 VND under the export tariff. Its change in saving is about 18 times and 12 times larger than the change in saving to Central Highlands region, the most disadvantaged region under those scenarios. Under free trade and export tariff scenarios, the Central Highlands region's per capita saving falls by 46,000 VND and 40,000 VND, respectively. As the soil in the Central Highlands is more suitable for planting perennial crops, including coffee, pepper, rubber, cashew, tea and cotton, the rural households are more likely the net rice buyer of other regions in the country. So the higher the rice price can be, the more disadvantaged the Central Highlands region will be.

Looking at the paddy farmer alone, farmers from all regions and all population groups can have profit increase only under free trade and export tariff. Figure 6 presents the change in paddy farmers' profit compared with the initial profit that they have before the shock. Export limit and export limit with producer tax hurt most farmers, though marginal, and hence, they cannot be the best choice in the long run as it generates the loss to majority of farmers. Coupled with unpredictable changes and bureaucratic procedures in getting approval on rice export for rice exporters, this is an inflexible policy tool that can create rent seeking behaviour and provide disincentives to enterprises in expanding the export market, cooperating closely with farmers in producing high quality rice and establishing the brand name for Vietnamese rice.







Source: Own calculation using the 2006 VHLSS

In addition to liberalizing export, the Government can help paddy farmers increase profit by facilitating fertilizer, land and credit markets as those three cost items make up as much as about 50 percent of the total cost in producing rice across all regions (see Figure 7), of which, chemical fertilizer accounts for about 27% of the total cost. According to the Plant Protection Director, Mr. Nguyen Tri Ngoc, Vietnam is expected to import about more than 500 ton of chemical fertilizer every year from now until 2020 (http://www.cuctrongtrot.gov. vn/?index=i&id=885). A stable and effective fertilizer market seems crucial to help farmers.

On credit market, loan interest is a substantial cost for farmers, especially in key rice exporters such as the Mekong River Delta and South East regions. Farmers, especially the poor in remote areas have difficulty in accessing the loans. Development of an effective and client-oriented rural credit system is strongly needed for Vietnamese farmers.

Using right rice variety is one of the most important factors for Vietnam to compete in the rice world market. Although Vietnam is the second largest rice exporter, the rice quality is much lower than its neighbour Thailand. In 2008, there has been some effort by the central and local governments on providing good rice variety to farmers. However, expenses on agricultural extension services seem negligible. Agricultural extension services are still very weak and in many case not practical. The agricultural services for modern agricultural provide a variety of products ranging from the choice of variety to the available soil to production and processing procedures. Improvement of agricultural services will no doubt help farmer substantially increase their farming efficiency.



#### Figure 7. Paddy Cost Structure by regions

maintenance 3% tools

3%

Pesticide

5%

1%

rent

6%

services 3% 5%

#### **5. Closing Remarks and Recommendations**

In summary the following points hold:

- Alternative rice export policies have small or no national impact on GDP, but large and differential regional impacts in this model. In general, policies other than increased trade (of some sort) greatly impact the Mekong River Delta region most in terms of lost profitability.
- Although the long term benefits of free trade in rice exports may predominate, depending on the extent of the increase in demand and export prices, CGE results and a micro-simulation show that the recent government policy of limiting exports potentially generates short-run regional benefits that favor 'pro-poor' outcomes and small rural households, in terms of both a lower CPI in rural areas and a larger proportion of individuals made 'better off' (by at least 1 VND, or more).
- However, even in the short run case, measures of average total savings per person, using a VHLSS-Simulation, increase in all regions (except in the Central Highlands) with free trade, or trade with a small export tariff.

It is thus clear that although export bans have a 'pro-poor' impact, free trade generates the largest increases in welfare, or measures of rice savings.

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United Nations, 1999. Handbook of Input Output Table Compilation and Analysis, New York, 1999, No.27.
	Industry – Commodity descriptions	Element of set C
1	Paddy	Paddy
2	Other crops	OthCrops
3	Livestocks & Poultry	Liv_Poultry
4	Forestry	Forestry
5	Fish Farming	FishFarming
6	Fishery	Fishery
7	Oil & gas	OilGas
8	Mining	Mining
9	Processed seafood	ProcSeafood
10	Processed Rice	ProcRice
11	Other Agricultural Processing	OthAgriProc
12	Textiles	Textiles
13	Paper	Paper
14	Wood	Wood
15	Rubber	Rubber
16	Non-Metallic Mineral Products	NonMetMin
17	Transport Equipment	TransEquip
18	Metal Products	MetalProd
19	Other Manufacturing	OthManu
20	Electricity & Water	ElecWater
21	Construction	Construction
22	Transport (Margin)	Transport
23	Communication	Communication
24	Trade (Margin)	Trade
25	Financial services	FinServies
26	Public Administration	PublicAdmin
27	Hotels & Restaurants	HotelsRest
28	Other Services	OthServices

### Appendix 1. List of 28 Industries and Commodi



### Appendix 2. Production structure for a producer in industry i in region r



Appendix 3. Consumption structure for a household in region r

### Appendix 4. Investment structure for a household in region r



### 6

### Protecting the Rural Poor: Evaluating Containment Measures Against Foot-and-Mouth Disease in Vietnam

Tom Kompas, Nguyen Thi Minh Hoa, Van Dang Ky<sup>1</sup>

#### **1. Introduction**

Vietnam has achieved remarkable progress in reducing rural poverty in the last twenty years, largely due to a series of extensive market reforms in agricultural production and impressive increases in economic growth at the national level. As the result, the number of designated 'poor people' has been reduced by more than two-thirds (Hansen and Nguyen, 2006). As income increases, demand for livestock products is also growing rapidly. Per capita meat production per year in Vietnam increased from 25 kg in 2001 to 34 kg in 2005 (MARD, 2006b), and Vietnam aims at reaching per capita meat production of 36, 46 and 56 kg per person in 2010, 2015 and 2020, respectively (GOV, 2008). To meet the targets set out in the 'Strategy for Livestock Development' by the year 2020, the husbandry industry of Vietnam needs to develop an industrialized husbandry, free of diseases to meet domestic demand and potentially large increases in international exports. However, to expand its export market, Vietnam has to fulfil requirements under the SPS agreement, in particular, by establishing regions free of designated 'List A diseases', including foot and mouth disease (FMD).

Along with the desire to increase exports of agricultural products, protecting animal and plant health in Vietnam protects rural assets and ensures that the market reforms that have decreased rural poverty are not largely offset by potentially devastating losses in the economic value of cows, buffaloes and pigs. The rural poor, in particular, rely on these animals not only for

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sources of income and nutrition, but also (in the case of cows and buffaloes) for transportation and work in rice fields. Data compiled for this report estimate the asset value of cows and buffaloes alone in rural Vietnam is \$4.9 billion USD (for 6 million cows and 3 million buffaloes, with an average value of \$547 USD per animal).

This study evaluates the containment measures used in Vietnam against FMD. Foot and mouth disease is a highly contagious viral disease that causes significant mortality in young animals and considerable morbidity in adults, with large losses in weight and economic value. In particular, this study conducts a cost-benefit analysis of a recent and aggressive vaccination program used in Vietnam against FMD. Programs of this sort are fundamental to protecting rural asset values and the livelihood of the rural poor.

Section 2 of the report describes FMD in Vietnam and its control measures. Section 3, the main part of the report, conducts the cost-benefit analysis on the vaccination program used in Vietnam to control and potentially eradicate FMD. Section 4 provides closing remarks and recommendations.

### 2. Foot and mouth disease status and its control in Vietnam

Foot and mouth disease is a highly contagious viral disease that causes significant mortality in young animals and considerable morbidity in adults, with large losses in weight and economic value. FMD is characterized by fever and blister-like sores on the tongue and lips, in the mouth, and on the teats and between the hooves. While the majority of affected animals recover, the disease often leaves them weakened and debilitated. The FMD virus can be found in all secretions and excretions from acutely infected animals, including expired air, saliva, milk, urine, faeces and semen. Transmission can occur by direct or indirect contact with infected animals and contaminated surfaces, and is commonly spread through the inhalation of the aerosolized virus, ingestion of contaminated feed, and entry of the virus through skin abrasions or mucous membranes (Aftosa, 2007).

FMD appeared very early in Vietnam (the first case reported in 1898) and has been in existence for more than a millennium at various scales. Since the extensive market reforms have taken place, the transportation of animals and animal products inside the country and the cross borders with China and Cambodia has resulted in an increase in the trend and quantity of infected animals, as well as an increase in the number of species being affected (including deer and goats). Three types of FMD viruses are in Vietnam. Virus type-O has been defined as the main strain since 1995, presumably as part of a pan-Asian epidemic. Virus type-A ('Malaysia 97') was discovered in 2004 due to the smuggling of cows from Cambodia. In 2005, virus type-Asia 1 was discovered from illegal animal smuggling from China (MARD 2008). Prior to the initiation of the vaccination program in Vietnam, in early 2006, the number of new infections each year among cows, buffaloes and pigs is given in Table 1, for the period 1999-2005. New outbreaks in 1999 and 2000 were dramatically high, but there are significant increases in the number of new infections in each year leading up to the beginning of the vaccination program.

	Buffalos / Cows					Pigs				
Year	FMD Provinces	FMD districts	Incursions	Infected	Dead or culled	FMD Provinces	FMD districts	Incursions	Infected	Dead or culled
1999	55	347	1,912	112,579	1,309	52	217	958	25,820	3,270
2000	48	126	1,708	351,284	15,136	51	266	1,148	42,999	14,986
2001	16	29	47	3,976	112	17	47	95	6,428	1,534
2002	26	71	183	10,287	194	28	75	208	6,933	2,229
2003	28	88	266	20,303	116	28	67	123	3,533	712
2004	32	134	490	25,658	189	22	35	87	1,555	725
2005	26	160	408	28,241	582	25	-	-	3,976	1024

## Table 1: FMD incursions, infections and dead or culled for cows,buffaloes and pigs in Vietnam, 1999 to 2005.

Source: MARD, 2008.

There are many challenges in the fight against FMD. The first challenge is how to quarantine and control the transportation of animals within the country and across borders. As Vietnam has a long border with difficult geographical conditions, contiguous to countries that are endemic with FMD, in particular, China, Cambodia and Laos, it is difficult to prevent illegal transborder trade of cattle. Second, domestic quarantine is less than perfect, due to a lack of local veterinary services with sufficient equipment and resources. Cooperation between the animal health agencies with relevant agencies such as the police, the military, and market management agencies is also not sufficient. Third, the level of awareness of various diseases, although growing rapidly thanks to education campaigns, is very low among the rural population and the Ordinance of Animal Health and along with comparable regulations on the prevention and transmission of FMD is not always and everywhere followed, making the containment of FMD in Vietnam a significant battle.

With increasing trans-border trade, fighting FMD inside the country alone is obviously not sufficient. Vietnam has actively been cooperating with other countries in the region to eradicate FMD. In addition, Vietnam has been a member of the World Organization for Animal Health (OIE) since 1991, and actively participates in the 'South-East Asia Foot and Mouth Disease Campaign 2020' (SEAFMD 2020), and with it, the Lower Mekong and Upper Mekong working groups under SEAFMD since 1997, all committed to combating FMD in the region. Vietnam has also received technical and financial support from many international organizations and countries in its effort to gain recognition of 'FMD free status' at least in some regions and localities in Vietnam.

Over the last decade, Vietnam has taken aggressive measures to combat FMD. In 2001, Vietnam launched the 'National Framework Plan' for FMD control 2001-2004, as part of

Vietnam's effort to integrate into regional efforts to contain and eradicate FMD. With the assistance from the OIE, and its own limited resources, the Plan aimed at establishing a sound legal framework on FMD prevention and protection, training veterinary staff, increasing the awareness of epidemiological characteristics and the economic impact of FMD, which all laid a solid foundation for developing a national plan on FMD containment and eradication in the following years.

Benefiting from the National Framework Plan, Vietnam has established a sound legal framework in FMD prevention and protection with the issuance of Decision No. 54/2001/QD/ BNN-TY, dated 11 May 2001, which was later replaced by the Decision No.38/2006/QĐ/BNN-TY, on 16<sup>th</sup> May 2006, on regulations regarding the prevention and control of FMD in animals, and Document No.444/HD/TY on 14<sup>th</sup> August 2001, which was later replaced by Document No.752/TY- DT on 16 June 2006, to guide the implementation of these regulations. In addition, a host of documents instructing the Provincial People's Committees and relevant ministries and agencies has been issued to engage in epidemic prevention and control.

Public awareness campaigns have also been extensive: 70 training courses have been held nation-wide on techniques of prevention and control of FMD and veterinary epidemiology for 6,000 participants from provincial and district veterinary departments and stations, and 1,443,000 leaflets, 82,648 posters, 15,000 handbooks on prevention and control of FMD have been issued. A video tape on FMD on animals and prevention method has been developed and has aired repeatedly on national and local television stations. Thanks to these activities, public awareness of FMD has improved significantly. In addition, Ministry of Science and Technology has assigned the Department of Animal Health with the VND1.8 billion project 'Research on epidemiological solutions for detection and control of foot and mouth disease in livestock' (MARD, 2005).

Following a serious FMD incursion and spread in 1999, causing serious damage to the livestock industry, the central Government in 2000 allocated 15 billion VND (equivalent to about 1 million USD) to support the purchase of vaccines in provinces and cities for the control of the disease. In 2001, 2002 and 2003, the central Government allocated on average VND 2-3 billion from national reserves to support the control of FMD in heavily affected provinces with budget constraints. Between 2001 and 2003, the Ministry of Finance and MARD have also received 4.7 billion VND as allocations to the Department of Animal Health for the prevention and control of FMD. At the provincial level, since 1999, on average each province has spent roughly VND 50-100 million per year on the purchase of vaccines and disinfecting chemicals, as well as supporting farmers whose animals are culled (MARD, 2008).

After five years of preparation, a major new initiative was launched in 2006. The Government of Vietnam established a comprehensive national program, costing 538,856 million VND (equivalent to about 34 million USD) for the containment and eradication of FMD over the five year period 2006-2010 (MARD, 2008). In practical terms, Vietnam follows a progressive zoning, which is based on the epidemiological data from 1994-2004, recommendations of the OIE and geographical conditions, livestock raising practices and other socio-economic factors and the FMD containment objectives (MARD, 2005).

Three zones (see Van et al. 2008 for maps with more details) with different strategies to handle FMD are established in Vietnam as follows:

- A control zone, which covers 19 border provinces and 22 border districts, has periodical vaccinations twice a year on 100 per cent of livestock for 2 years since the year of the outbreak. The scope and rate of the follow-up vaccination is to be defined after completion of the first 2-year period, depending on the actual situation.
- A buffer zone includes 18 provinces adjacent to the control zone with high risks of FMD outbreak. Periodical vaccination of 80 per cent of high-risk livestock, designed as the livestock in the areas with outbreaks in the past, along control on movement along main roads and through animal markets.
- A Temporarily free zone covers 27 provinces, with 10 provinces in the Red River Delta, 4 provinces in the focal exporting area (Nghệ An, Thanh Hoá, Phú Thọ, Vĩnh Phúc), 9 southwest provinces and 4 Southeast provinces. No vaccination is conducted in these areas, except for ring vaccination in case of a widespread outbreak.

Along the lines with the vaccination program, disease surveillance is carried in an active manner by improving the veterinary system from central to local levels, assisting with early detection of the disease and identifying the virus type and sub-type by doing blood tests. In control zones, the sample size of the blood survey is based on the herd size of susceptible livestock and other disease factors. In the buffer zone, the sample size of the blood survey is based on the herd size of the susceptible livestock in past outbreaks and designation of 'high risk' zone (i.e., villages surrounding livestock trading markets and slaughter houses; communes acting as intermediate points along the trading path areas for livestock; towns passed by national highways, and so). In temporarily free zones, the disease on buffaloes and cows is investigated using 3ABC ELISA tests, with a sample size of 10-20 cows or buffaloes for each commune, depending on herd size. Totally, there are 5,260 samples collected each year of which 4,700 sample are used for blood tests, 500 for virus examinations and 60 samples for virus separation.

After three years of program implementation, Vietnam has made substantial progress in containing FMD with the number of outbreaks and newly infected animals declining dramatically. In the year 2006, the total newly infected animals (including buffaloes, cows and pigs) numbered 95,000 heads, identifiable in 52 out of 64 provinces. In the year 2008, this number has reduced to roughly 2000 heads in 10 provinces. Figure 2 shows data for the number of newly infected animals in Vietnam. The vaccination program is thought to have its key impact (given two inoculations in 2006) in September 2006. The left-hand panel in Figure 1 shows newly infected cows and buffaloes since January 2006. The right-hand panel shows newly infected animals since September 2006. The decrease in the mean and variance of newly infected animals is dramatic.

### Figure 1: The effect of vaccination on newly infected animals. Left-hand panel is newly infected animals from January 2006, by month; the right-hand panel is newly infected since September 2006.



Source: MARD, Department of Animal Health, 2009.

It is important to note, however, that vaccination doses are not evenly distributed among species (see Table 2). Only about 3 percent of pigs are vaccinated compared with more than 40 per cent of buffaloes and cows. There are a number of reasons for this. First, the economic life span of pigs is relatively short, about 6 to 8 months compared with 12-24 months for cows and, in some cases, even up to 10 to 15 years for cows and buffaloes if these animals remain with farmers for many years to help on farm and in rice fields. Therefore, for pigs, it is deemed more economic to slaughter if infected, rather than to vaccinate. In addition, as the life span of a cow or buffalo is longer, the FMD virus will stay longer in the environment with these animals, thus increasing the risk of further infection. Second, vaccination is more effective in cows and buffaloes than in pigs (with effectiveness rates of 80 versus 50%). Third, it is often the case that the FMD is transmitted from cows or buffaloes to pigs, and far less likely in the opposite direction. Hence, increasing the immune system and concentrating on FMD in cows and buffaloes is more likely to help control FMD in pigs.

Year	Buffalo/cow				Pig			
	Herd size	Infected	Vaccinated heads	Vaccination rate	Herd size	Infected	Vaccinated heads	Vaccination rate
2006	9,431,845	64,888	4,032,530	43%	26,855,330	28,483	739,386	3%
2007	9,721,118	5,916	4,032,530	41%	26,560,651	5,539	739,386	3%
2008	9,235,480	1,369	4,032,530	44%	26,701,598	23	739,386	3%

 Table 2: Vaccination rates by species for the years 2006-2008

Source: Own calculation based on the data from GSO (2007), GSO (2008) and MARD (2008)

# **3. Cost Benefit Analysis of the National Strategy on Containment and Eradication of Foot and Mouth Disease**

Of particular interest in this report is the recent aggressive vaccination campaign and its cost effectiveness. To carry out an economic assessment on the 'National Strategy on Containment and Eradication of Foot and Mouth Disease', initiated in 2006, we do a cost benefit analysis of this strategy. We focus only on the cost benefit analysis of vaccination for buffaloes and cows as the vaccination rate of these species is more than 40 per cent. This vaccination rate in reality may be much higher as information on the vaccination paid privately by farm households and enterprises is not available.

#### 3.1 The cost-benefit analysis (CBA) strategy

The cost benefit analysis requires a combination of epidemiological and economic modelling. The epidemiologic modelling is used to simulate the FMD spread assuming there was no vaccination program in place. Using this information, together with information on vaccination costs and the value of damages that result from the disease provides all of the necessary information for the construction of net present values and benefit-cost ratios. To fix ideas, consider Figure 2. The solid and smooth line (which at one point becomes dotted) represents a logistic growth pattern for the spread of FMD in an environment. (Actual growth and spread rate models are usually much more complicated, of course, and often combine area and density measures.) The vaccination program is assumed to begin at the point where the dotted line begins, with hypothetical immediate impacts, with random fluctuation, resulting in falls in the number of infected animals (as new disease-free replacements take the place of cows with FMD that are killed or sold for meat products in the market).



Figure 2: The spread of infected FMD animals and a containment and eradication action

The benefit of the vaccination program in this diagram is measured as the difference (at any time *t*, but typically at full saturation of the population without vaccination) in the number of infected animals without the vaccination program (i.e., the dotted line), and the actual number of infected animals with the vaccination program in place. The benefit is thus the value of the avoided losses due to FMD with vaccination, given that there are fewer FMD animals. A more aggressive vaccination program, compared to the benefits or the value of the avoided losses. The precise measure of net benefits can also be calculated as the difference between the numbers of infected cows without vaccination, compared to those with vaccination, at each point in time until saturation of the population. This measure of cows, once again, has to be valued and compared relative to the cost of the vaccination program.

In our CBA we follow ten basic principles, given by:

- 1. The measure of benefits is given by all known avoided losses (e.g., losses to plant, animal and human health; damages to the environment, losses from trade bans, spillover effects and social costs, etc.).
- 2. The measure of benefits is conditional on an area and density spread model and specific actions taken (and their likely effects).
- 3. The measure of cost is the cost of all specific containment or eradication actions (e.g., sprays, vaccinations, screening, inspections, blood tests, public awareness, etc.).
- 4. Prices and costs may vary over time (e.g., marginal losses tend to rise over time for environmental assets; depending on price elasticity, an FMD incursion can increase the price of beef over time).

- 5. Where dollar amounts of costs and benefits cannot be measured by market values, non-market valuation methods must be used (e.g., contingent value, hedonic pricing or choice modelling exercises).
- 6. Since streams of costs and benefits vary over time, and potentially occur at different points in time, all dollar amounts must be discounted to the present.
- 7. The discount rate is typically the 'Treasury Bill' or 'Bank Rate' (i.e., the common or 'non-risk adjusted' rate).
- 8. The time horizon for discounting is normally contingent on the time taken for full biological or spatial (area and density) saturation. (With discounting, dollar values may be close to zero before this time, and/or the marginal cost of ongoing containment may equal the marginal benefit well before saturation, and/or across different containment measures; or additional net present value benefits may become negative. Comparing containment measures across various incursions with different duration or with varying time horizons may require 'Annual Equivalent Cost Methods'.)
- 9. Measures of net present value and/or the benefit-cost ratio should reflect likely outcomes, based on given or estimated probability distributions of key parameter values (e.g., Monte Carlo draws based on a probability distribution, for example, for spread rates, or the variance in market values, gives a range of benefit-cost ratios with assigned likelihoods).
- 10. Sensitivity analysis on parameter values (to determine their relative importance) should be reported and, where possible, estimates of net present values or cost-benefit ratios with different 'states of nature' should be constructed.

### 3.2 Epidemiological modelling

As mentioned, our CBA needs to compare the difference in the number of FMD infected buffaloes and cows with and without vaccination program. Under the scenario of not having vaccination, and assuming a monthly time step, the growth in the number of infected buffaloes and cows is assumed to follow a Verhulst-Pearl logistic function, or:

$$\frac{dN(t)}{dt} = rN(t) \left( 1 - \frac{N(t)}{N_{\text{max}}} \right)$$
(1)

for N(t) is the number of infected buffaloes and cows at time t, r the biological growth rate and  $N_{max}$  the maximum number of potentially infected buffaloes and cows in the population. Data on infected buffaloes and cows for the first eight months of 2006 is used as the benchmark for simulating the FMD situation when there is no vaccination, with August 2008 as the cutoff point for the beginning of the vaccination-affected period. There are a couple of reasons to justify this choice. First, the month of starting the vaccination program was specified as March-April in Vietnam but it was not actually implemented until May, June or even as late as July in some areas as there was supply shortages, transportation and other bureaucratic delays. Second, as most animals were first time vaccinated, the vaccination could take effect only after the second shot, four weeks later. To estimate equation (1) we approximate the left-hand side of this equation by

$$\frac{1}{N}\frac{dN}{dt} \approx \frac{N_{i+1} - N_i}{1/2(N_{i+1} - N_i)} = 2\frac{N_{i+1} - N_i}{(N_{i+1} - N_i)(t_{i+1} - t_i)}$$
(2)

and regress

$$\left\{\frac{N_{i+1}+N_i}{2}, 2\frac{N_{i+1}-N_i}{(N_{i+1}-N_i)(t_{i+1}-t_i)}\right\}_{i=1} \cdot N$$
(3)

on

$$r - \frac{r}{N_{\text{max}}} N \tag{4}$$

to estimate *r*. Since FMD can spread easily, and especially so in a country like Vietnam, we assume that  $N_{\text{max}}$  is simply the size of the total population of cows and buffaloes in Vietnam, or roughly 9 million head. By this procedure, the estimated monthly value of *r* is .0263 with a standard error of .0048 and a *p*-value of .003. The standard error is used to generate randomness in the pattern of FMD spread in the CBA analysis.

The CBA must be calculated over a forward period, potentially as long as the time it takes to reach full saturation of the population without vaccination or  $N_{\text{max}}$ . To do so we need an assumption about the number of newly infected animals with vaccination, beyond the sample months detailed in Figure 1. To be conservative, we assume that newly infected animals in the future follow the same pattern as given in the right-hand side of Figure 1, from month 18, or the series in the actual data from the last 17 months (i.e., from July 2007 till December 2008). To mimic a future pattern along these lines we simulate by assuming random draws with from a stratified Monte Carlo exercise with the mean and variance set by the actual data in Figure 1. The reason this is a conservative procedure, of course, is that one would expect (and certainly hope) that the vaccination program should decrease the mean and variance of the number of infected animals over time. Data from 2009 and 2010, when it is available will help determine whether this is the case. An example realization of this process, for an average of ten thousand different realizations is given by year in Figure 3.

#### Figure 3: Random process of newly infected animals given by a stratified Monte Carlo draw, aggregated to years, from months, under the vaccination program



This now allows us now to compare the number of infected animals both with and without the vaccination program.

#### 3.3 Economic benefits and costs

The economic benefit of the vaccination program is given by difference in the economic value of the cows and buffaloes that would have been infected without the program. The benefits are comprised of four key items: (a) the value of culled and/or dead cows and buffaloes; (b) the value and weight loss of cows and buffaloes due to being FMD infected; (c) any milk loss due to infected cows; and (d) any other expenses associated with an outbreak. We ignore any effect on the price of meat in local and national markets, since this data is not readily available. Some of the key parameter values are listed in Table 3 below. Construction of these parameters is detailed as follows:

Average weight of a cow and/or buffalo: The average weight of a cow and/or buffalo is assumed to be 250 kg. This is the average weight of 175 buffaloes and cows culled due to being FMD infected in 2008 in the province of Nghe An, where a major FMD outbreak occurred, and is also based on reports by the Department of Husbandry, indicating that the average cow weight is roughly 200 kg, while the average buffalo weighs more than 300 kg (MARD, 2006b and MARD, 2006c). Unit price of live cows and buffaloes per kg: This value is given as VND 35,000 per kg (equivalent to 2.19 per kg USD using the exchange rate of 16,000 VND/USD) for the year 2008. This also roughly corresponds to the compensation rate provided by the Government of Vietnam for culled cows and buffaloes with FMD, currently at 30,000 VND, which was deemed to be as much as 70 per cent of market price. Unit price of fresh milk: The farm gate price for fresh milk is 7,000 VND, 6,000 VND and 5,000 VND per litre in 2008, 2007 and 2006 respectively. Weight and value loss (as a percentage) due to being FMD infected: When a cow or buffalo is recognized as FMD infected, it is reluctant to eat, which leads to rapid weight loss. The Department of Animal Health is Vietnam estimates the average weight loss over the economic life span of the animal to be 25 per cent (MARD 2008). We assume a normal probability distribution of  $N \sim (1, 0.05)$  for this parameter.

*Compulsory culling and natural death rate*: Although it is reported that the overall mortality rate in cattle is less than 5 per cent and 50 per cent of the calves may die from myocardial degeneration (Fowler and Mikota, 2006), the data on dead and culling livestock in Vietnam from 2006-2008 indicates a rate of 2 percent for mortality and culling. *Dairy*: The ratio of dairy in the total infected herd is obtained by using the same ratio of the ratio of dairy in the total herd in Vietnam in years from 2006 till 2008 (GSO 2007 and GSO 2008). The milk produced per dairy per year for 2006-2008 is obtained from the GSO (2007) and GSO (2008). In many cases, FMD can result in a permanent loss in milk production. We assume a 50 per cent reduction in milk production based on established studies in MARD (2008). A normal distribution for this parameter value is assumed, with a standard error of .05. Finally, the *unit cost of other expenses* such as petrol, checkpoint, and staff duty allowances per animal is the average of spending level per cow and buffalo drawn from 18 outbreaks in 10 different provinces in 2008 (Van, 2009).

	2006	2007	2008
Cattle unit price per kg (USD)	1.62	1.82	2.19
Milk price (farm gate) per litre (USD)	0.31	0.38	0.44
Weight and value loss due to FMD infected animal (%)	25% N(1,0.05)	25% N(1,0.05)	25% N(1,0.05)
Weight per cow/buffalo (kg)	250	250	250
Compulsory culled percentage (%)	2%	2%	2%
Ratio of dairy in the total herd (%)	0.63%	0.63%	0.70%
Milk produced per dairy cow (litre/year)	3,816	3,816	4,027
Loss in milk production due to FMD infected animal (%)	50% N(1,0.05)	50% N(1,0.05)	50% N(1,0.05)
Meat production (tonnes)	224,746	273,651	298,739

Table 3: Key parameter values for the measures of the benefits from vaccination
against FMD in Vietnam, for years 2006 to 2008

The cost of the vaccination program was obtained from actual expenditures on the national program, for the years 2006-08, and projected expenditures for the years 2009 and 2010 (MARD (2008) and Van (2009)). Table 5 summarizes the key information. There are a number of different categories of expenditures, for example, the development of epidemiology maps, and blood tests and virus studies. The main cost, however, is the cost of vaccination. In Table 5 the Dong to USD rate is 16,000:1. The total cost of vaccination in 2008, for example, is 10.7 million USD, and is projected to be 11.1 million in 2009. Contingency funds are used to handle outbreaks of FMD. Values of this category for 2006 to 2008 are actual expenditures, assumed to remain constant per year in 2009 and 2010. The total cost of the vaccination and containment program from 2006 to 2010 is 47.3 million USD.

The discount rate used in the CBA is 5 per cent, or the current State Bank of Vietnam discount rate promulgated in the State Bank of Vietnam's Decision No. 837/QĐ-NHNN dated April 10, 2009. All costs and benefits are forward projected based on estimates of changes in the consumer price index. The resulting inflation rate is assumed to take a mean of 7 per cent, with a standard deviation of 6 per cent. For the most part, assumed changes in the average price level affect both the stream of costs and benefits in a comparable manner. Sensitivity measures are reported for the rate of discount.

	2006	2007	2008	2009	2010
Management expenses	16,313	40,625	55,625	55,625	55,625
Training			34,188	34,188	34,125
Awareness campaign	69,688	69,688	104,500	104,500	104,500
International conference			4,375	4,375	4,375
Domestic conference			1,250	1,250	1,313
Outbreak reporting			8,375	8,438	8,438
Sending sample abroad for virus type separation			2,250	2,250	2,250
Research on causes of FMD			20,000		
Development of epidemiology map			2,750	2,750	2,750
Blood test analysis and virus study	7,500	18,750	123,125	123,188	123,188
Sterilization chemical	15,000	15,000	118,125	118,125	118,125
Labour cost for vaccination	1,093,750	1,093,750	1,100,500	1,100,500	1,100,500
Control zone vaccine for buffaloes and cows	1,789,992	2,563,130	2,416,376	2,668,688	2,668,688
Buffer zone vaccine for buffaloes and cows	2,986,853	1,523,375	2,715,037	2,852,750	2,852,750
Contingency fund <sup>(*)</sup>	1,158,323	1,193,384	4,041,523	4,041,523	4,041,523
Vaccine under Decision 738 for buffalos & cows	190,646	504,225			
Total Cost	7,328,064	7,021,926	10,747,998	11,118,148	11,118,148

## Table 5: Total costs of the vaccination program, actual and projected from 2006 to 2010, measured in USD

#### Source: MARD (2008)

(\*): Data compiled from various decisions issued by MARD in 2006-2008 on the use of the Contingency Fund and vaccine allocation in accordance with Decision No. 738/QD – TTg dated 18/5/20006

#### 3.4 CBA results

Since we have assumed that the containment action corresponding to the vaccination program continues at both the same cost and the same pattern of newly infected animals over time, the measure of net present value (NPV) and the benefit-cost ratio (BCR) will partly depend on the choice of the planning horizon. In cases where a containment action leads to eventual eradication or very small amounts of newly infected animals, with consequently small ongoing vaccination costs, both NPV and the BCR would be maximized at the point where the entire population of infected animals, without the vaccination program, would be infected, or at full saturation. With significant and ongoing containment costs this is not the case. Given the logistic spread growth pattern, at some point the extra costs associated with vaccination may be outweighed by the benefits of having less newly infected animals. Of course, realism suggests that the vaccination program should eventually decrease the mean and variance of newly infected animals, and the cost of the vaccination program should clearly decrease over time as the need for vaccination falls with the proportion of the herd now immune or vaccinated against FMD.

Table 6 presents the main CBA results. The base discount rate is 5%. The sensitivity of the discount rate is then tested using the discount rate over the range of 5-7%. Given the spread model, the year 2040 is the time horizon where the population is FMD saturated in the absence of a vaccination program. Year 2033 is the time horizon in which the net present value is maximized. After the year 2033, on average, the net present value of benefits starts to fall, given that the marginal cost of the vaccination program (again, assuming the same pattern of newly infected animals) in year 2034 exceeds the marginal benefits. This property is shown in Figure 4. The NPV in both 2033 and 2040 is substantial, ranging from 1.16 to 1.22 billion USD. We take 2033 as the base case. Given uncertainty in the spread rate, the loss is weight and value of an FMD infected animal and the loss in milk production, the resulting BCR and NPV measures have a standard error, as reported in Table 6. As such, Figure 5 shows the relative frequency distribution for NPV for the year 2033 with a 5% discount rate, and Figure 6 illustrates the relative frequency distribution for the BCR.

	Benefit-Cost Ratio		Time Horizon 2033 (million USD)			Time Horizon 2040 (million USD)		
Discount Rate %	Time Horizon 2033	Time Horizon 2040	Net Present Value	Net Present Benefit	Net Present Cost	Net Present Value	Net Present Benefit	Net Present Cost
0.05	5.26	4.06	1,220	1,513	294	1,163	1,558	395
	[1.25]	[1.04]	[285]	[282]	[43]	[300]	[292]	[70]
0.06	5.17	4.13	1,033	1,286	254	991	1,320	329
	[1.2]	[1.03]	[239]	[237]	[36]	[250]	[244]	[55]
0.07	5.06	4.17	877	1,097	221	846	1,122	276
	[1.14]	[1.01]	[202]	[200]	[30]	[210]	[205]	[44]

### Table 6: Main CBA results: measures of the benefit-cost ratio and net present values bydiscount rate and time horizon. Standard errors are in brackets

# Figure 4: Net present values of the vaccination program at a 5% discount rate, 2006 to 2040



# Figure 5: The relative frequency distribution for NPV for the time horizon 2033 with a 5% discount rate. Mean is 1.22 billion USD with a standard error of 285 million USD



## Figure 6: The relative frequency distribution of the BCR for the time horizon 2033 with a 5% discount rate. Mean is 5.26 USD with a standard error of 1.25



Both Figures 5 and 6 show that NPV and the BCR are well above zero and one. The mean NPV is 1.22 billion USD and the mean BCR is 5.26, again, at a 5% discount rate, both showing a substantial payoff to the vaccination program, even under conservative measures. Table 6 also shows the effect of changes in the discount rate on these ratios. At a 7% rate NPV is 877 million and the BCR is 5.06. It is also important to note from Figure 5 that, with a 5% discount rate, the NPV for this vaccination program does not become positive until 2013, or only after 8 years of the program. It thus takes some period of time for positive returns to emerge.

Finally, rather than assuming ongoing containment, the CBA results change considerably if at some point FMD is no longer just contained, but eradicated. We look at two cases. First, rather than assume a containment process that arbitrarily 'winds down' to zero newly infected cows, we simply assume the same pattern of containment and newly infected cows but with complete eradication in the year 2014, as if the current vaccination program is renewed for another four year period. After 2014, by assumption, there is thus no newly infected FMD animals and the vaccination program (and its cost) ends. Figure 7 shows net present values for this case.

### Figure 7: Net present values assuming eradication in 2014, so that the number of newly infected animals and the cost of vaccination is zero in year 2015 forward, at a 5% discount rate, for years 2006 to 2040



As expected, NPV now reaches a maximum in the year 2040 in Figure 7, with full saturation of the population. NPV is now 1.49 billion USD, with a standard error of 292 million (see Table 7). The present value of benefits in this case is 1.565 billion and the present value of costs is 77 million. Costs are much lower of course since the vaccination program ends in 2014, and benefits increase (since the number of newly infected cows also goes to zero), but not dramatically compared to the base case since the vaccination campaign is already relatively 'late' in the growth process.

The second case is where eradication occurs in 2020, consistent with the OIE (2007) projections for FMD eradication for Vietnam. We again assume the same pattern of newly infected animals and the cost of vaccination program until 2020. Table 7 contains the relevant CBA ratios. NPV for eradication is lower for eradication in 2020 as expected, compared to eradication in 2014, but higher than the base case. Nevertheless, it is important to note that although cost measures vary considerably across the two cases (eradication in 2014 and 2020 in particular), there is little difference in net present benefits. The containment and eradication exercise is thus occurring relatively late in the FMD spread process, so much of the gains have already been dissipated.

Program/Year	BCR	Net Present Value (million USD)	Net Present Benefit (million USD)	Net Present Cost (million USD)
Eradication in 2014	20.35	1,488	1,565	77
	[3.87]	[292]	[292]	[2.83]
Eradication in 2020	11.46	1,427	1,564	137
	[2.32]	[29,326]	[29,325]	[10.72]
Base Case Ongoing Containment	5.26	1,220	1,513	294
to 2033	[1.25]	[285]	[282]	[43]

## Table 7: NPV and BCR relative year of eradication, compared to the base case of ongoing containment

#### 3.5 Qualifications

There are a number of qualifications to make to the above results. First, the measure of 1.22 billion USD in net present value from the vaccination program must be seen as a very conservative measure. There are a number of reasons for this. The calculations assume that the vaccination program simply maintains the pattern of newly infected animals (based on the stratified Monte Carlo draws) over the period of observed data (from July of 2007 to the end of 2008). This is still relatively early in the vaccination program. Instead, of the same pattern of new infections, it is more likely that the vaccination program will further decrease the mean and variance of new infections. If this is the case, the BCR and the net present value of benefits will be much higher, of course. As shown, the simulated case of eradication by the end of 2014 generates a NPV of 1.49 billion USD and a BCR of 20.35. Something less than full eradication (i.e., containment levels with a low mean and variance for newly infected animals) will carry comparable net benefits. The measure of 1.22 billion is also conservative is then sense that any spillover benefits from cows to pigs is ignored. This could be considerable if there is a vector for FMD that runs largely from cows to pigs. The gains from not having a trade ban for exporting beef if Vietnam is declared FMD free, or there are FMD free zones in Vietnam, is also not considered. Although this is not a issue at the moment, since Vietnam is a net importer of beef, it could represent a substantial potential loss in the future.

The second qualification to the NPV measure of 1.22 billion is that the calculation assumes that vaccination remains as effective in the future as it is now. In other words, it assumes that new strains of FMD do not enter the country, or if they do an appropriate vaccine can be deployed to counter their effects in the same manner as given in the stratified Monte Carlo exercise for newly infected animals. Finally, in a related manner, the calculations also assume no new incursions of FMD, and especially incursions that go undetected in zones without control. This seems likely under the current program, given that the entire border areas are control zones, with 100% vaccination, but with lack of restrictions on movement controls FMD outbreaks could still occur.

### 4. Closing Remarks and Recommendations

Buffaloes and cows are the symbol of wet rice culture. Raising buffaloes and cows is a tradition in rural Vietnam, and they are raised and used extensively for ploughing and other farm duties. According to MARD (2006b), out of a total 13 million farm households, roughly 4 million households have (on average) 1.6 cows per household. Buffaloes and cows not only help farmers in their production but also are often the most important depository of savings or the measure of household assets. Indeed, many poverty eradication projects provide loans to the farmers to make investment in raising cows. The 'Hybrid-cow Raising Project for Poverty Reduction' in Kon Tum, the cow lending project in Binh Thuan, or loans to ethnic minority households to buy cows in An Giang (VASS, 2009) are good examples of this. The vaccination program against FMD, the focus of this report, and other public policies that protect the stock of rural assets, including cows and buffaloes, are essential in Vietnam.

The CBA analysis in this report highlights the importance of the vaccination program. Even with the most conservative measures and methodology, the gains from the program are substantial at a NPV of 1.22 billion USD. This is equivalent to 82 million USD every year, in current dollars, from 2006 to 2033, with a BCR of 5.26. NPV can also increase substantially to nearly 1.5 billion USD, depending on the time at which full eradication from the program can be declared.

There are several policy recommendations that flow from these results. First, calculations of net present value show that although the overall gains are substantial, positive returns do not occur until year 8 of the program, or in 2013. Current planning in Vietnam is to re-evaluate the effectiveness of the program in 2010, when the staged funding of the current vaccination program formally ends. The CBA results thus argue for continued funding of the vaccination program past 2010. The full measure of the program's effectiveness will partly depend on results for the number of newly infected FMD animals in 2009 and 2010, data yet to be known. Hopefully, the mean and variance of the number of newly infected animals will fall, but even if the same pattern of newly infected animals occurs, it is clear that to realize the benefits of the current vaccination program it should be extended beyond 2010.

Second, given the nature of net present value in each year of the program, it seems clear that a more aggressive vaccination program may be beneficial. The call for eradication in 2020 (OIE 2007), is late in the time horizon, where much of the net benefits are already dissipated. Earlier eradication, and clearly so since the reduced costs of winding down the vaccination program early are substantial, generates considerably more net present benefits. Of course, earlier eradication may require more resources now to vaccinate (i.e., more than the roughly 11 billion USD that is already spent per year), but if a more aggressive vaccination program can lead to even earlier eradication, or at least fewer amounts of newly infected animals, the extra gains are more than worth the extra expense.

In this regard it would be worthwhile to investigate the trade-off between more vaccination and containment expenditures now, and the likely sequence of newly infected animals and the time of declared eradication. Best practice would equate the extra costs of adding to the containment program, with increased vaccination, to the marginal benefits of earlier eradication or less infected animals. In addition, it is important to examine whether there are sufficient measures in place for early detection of FMD in an area. Spending more on blood tests for local surveillance can also increase benefits substantially.

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### 7

### **Compulsory Social Security Participation: Revealed Preferences**

Castel Paulette To Trung Thanh

#### **1. Introduction**

Since 1947, the Vietnam Social Security (VSS) has provided social insurance for public servants and armed forces personnel in Vietnam. In 1995, the Government merged the social insurance unit of the Ministry of Labor, Invalids and Social Affairs (MOLISA) with that of the Vietnam General Confederation of Labor (VGCL). At the same time, the system became mandatory to employees in the newly developing private sector. The consolidated system is publicly managed by the Vietnam Social Security (VSS) who collects contributions and pays social insurance benefits (including sickness, maternity and paternity benefits; work injury and professional disease benefits, pension and survivorship benefits, and health insurance). The mandatory coverage<sup>1</sup> of the private sector was first restricted to enterprises with 10 or more employees. From 2005 onwards, all enterprises, regardless of size, have the obligation to register to VSS all employees that have signed a labor contract of 3 months or longer.

In recent years, VSS participation has been rapidly increasing along with the development of the private sector. The number of contributors (public and private employees) increased from 3.23 million people in 1996 to 6.97 million people in 2007. While private employees represented only 4 percent of the contributors in 1995, by 2007, they had already represented 44 percent of the total contributors. Still, the number of contributors, if compared to the number of people reported to be employed in Vietnam, is relatively small. It only covers 38.8 percent of the 17.46 million people reported to be receiving wages equal to or above the legal minimum wage. Reasons for this low coverage are unknown. A possible reason could be that many of these people are not under a formal labor contract, or that their employers are not well aware of their social obligations. Another reason could also be that employers evade registering (with

<sup>1.</sup> From 2006 onwards, self-employed and farmers have been able to participate in a voluntary publicly-managed pension fund. Health insurance has also been made open to participation since 2005.

or without employees' implicit agreement) so as to be able to obtain higher revenues or to offer employees higher net wages.

Determining the reasons that explain Vietnam's low social security coverage has direct policy implications. If the reasons indeed include the fact that employees are not aware of their legal rights or employers simply do not respect the law, public awareness campaigns and law enforcement should help improve coverage. However, if social security evasion allows employees to obtain higher net wages, employees as well as employers might have incentives to resist the changes, hence these policies might fail.

This paper investigates these issues using the information obtained from the 2006 Census of enterprises. This database includes 129,566 enterprises from the public sector (2.6 percent), the private sector (94.2 percent) and the foreign-invested sector (3.2 percent). Therefore, it is expected to cover most of the employees that should be registered to the Vietnam Social Security according to the law, with the exceptions of employees of the public administration and some minor groups such as students currently enrolled in overseas institutions. However, as the private sector in Vietnam includes many households units whose identity is difficult to determined, the 2006 Census of enterprises is unlikely to be exhaustive of all small enterprises in Vietnam. According to the Census of enterprises, the total number of employees in state-owned and private enterprises in Vietnam in 2005 was 6,038,456. The 2006 household survey, however, found the number to be 17,460,658.

The study starts with a classification of enterprises by their VSS participation. Among the enterprises that contribute, one striking feature is that the average share of wage bill of the contributions paid to the Vietnam Social Security is much lower than the contribution rate established by law. Even if the enterprises that do not register their employees are excluded from the calculation, the average ratio is still only 7.6 percent while the 2006 legal rate was 23 percent. The study hence examines this issue before investigating the characteristics of the enterprises that do not register their employees. The paper shows that this low ratio is due to a widespread practice by enterprises to pay contributions on lower wages than actual wages. The paper then further investigates who benefit from the practice of evading registration and from the practice of under-reporting wages to VSS. The results indicate strong evidence that employees in enterprises that are not registered to VSS and in enterprises that under-report wage indeed receive higher net wages. Evidence of enterprises' higher average revenue per worker, however, is not strong. The last section discusses the implications of these findings with regard to future trends in coverage and social security policies toward the low income. They argue that the widespread practice of under-reporting wages to VSS will increasingly erode public appreciation of the insurance role played by social security in reducing income shocks. This, in turn, will discourage employers and employees from recognizing the risks arising from evasion and/or under-reporting wages. This section also argues that the practice of underreporting wages means that the system has to guarantee the minimum pension to many retirees that are not low income earners, thus leading to a leakage that is both unfair and costly. Both consequences raise concerns about the system's capacity to increase coverage and financial sustainability in the long-term.

### 2. Registering Employees to the Vietnam Social Security

Table 1 reports the participation rate of enterprises and employees to the Vietnam Social Security, which is the percentage of firms that contribute to the Vietnam Social Security in the total number of firms. The results show that among the 129,566 surveyed enterprises only 59,346 firms (45.8 percent) contributed to the Vietnam Social Security. As expected, the participation rate of state-owned enterprises is very high (95.4 percent) with an average size of 496 employees. Since it is rather unlikely that in any Vietnamese state-owned enterprise does not comply with the law, the 4.6 percent of non-participation is likely to be due to reporting errors.

In contrast, the participation rate of enterprises in the private sector is low (83.1 percent in the case of the FDI enterprises with an average size of 362 workers and 43.2 percent for the rest with an average size of 38 employees). Only those enterprises with some public capital show a higher participation rate (92.8 percent).

	Total	Contributing to VSS	Participation Rate (%)
Total	129,566	59,346	45.8
Public	3,378	3,222	95.4
Central State Enterprises	934	920	98.5
Local State Enterprises	1,309	1,289	98.5
Joint Stock with Public Capital (>50%)	1,135	1,013	89.3
Private	122,025	52,667	43.2
Collective	6,220	2,771	44.5
Private	36,805	9,840	26.7
Private Limited Companies	62,847	31,173	49.6
Joint Stock with Public Capital	1,320	1,225	92.8
Joint Stock no Public Capital	14,801	7,643	51.6
Foreign-Invested	4,162	3,457	83.1
100% foreign	3,289	2,727	82.9
Joint venture	873	730	83.6

Table 1Enterprises Participation Rates to the Vietnam Social Security

Source: Authors' calculation based on the Census

### 3. Share of Vietnam Social Security Contributions in Total Wages

Among the enterprises that contribute, one striking feature is that the average share of wage bill (i.e. total wage payments) of the contributions paid by enterprises to the Vietnam Social Security is much lower than the contribution rate established by law. As shown in Box 1, the ratio required by law should be 23 percent. The figures in Table 3 indicate that it is in reality far lower at 7.6 percent.

#### **Box 1: Vietnam Social Security Contribution Rates**

Social contributions are paid into four funds: the fund for pension and survivorship benefits, the fund for sickness, maternity and paternity benefits, the fund for work injury and professional disease benefits and the fund for health insurance payments. The composition of the contribution rates applied in 2005 on the wages reported in the Enterprise Census is described in Table 2.

Type of benefits <sup>b</sup>	Employers	Employees	Total
Pension and survivorship	10	5 ª	15
Sickness, maternity and paternity <sup>c</sup>	$4^{d}$		4
Work injury and professional disease <sup>c</sup>	1		1
Health insurance <sup>e</sup>	2	1	3 <sup>f</sup>
Total	17	6	23

#### Table 2 Contributions rates

Note: (a) Increased to 6% in 2007; starting from 2010, to be increased by 2 p.p. every 2 years until it reaches 12%, after which the rate will be increased by 1% every year until it reaches 8% (b) The 2006 Social Security Law foresees the introduction of unemployment benefits in the future (c) Contribution rates were merged into only one category before the 2006 Social Security Law (d) Reduced to 3% by the 2006 Social Security Law which required 2 p.p. to be kept in enterprise reserves (e) The functioning of health insurance is described in a specific law; (f) Under the 2008 Health Insurance Law, possibly increased up to 6% depending on the financing needs.

These rates are determined based on net wages i.e. on the amounts employees take home after the social security contributions are deducted.

Although the law distinguishes the portion paid by the employees from the portion paid by the employers, employers are the ones responsible for the overall payment of the contributions due. Accordingly, the amount of contributions reported in the Enterprise Census should be equal to 23% of the total amount of wages paid by the enterprises.

Starting from 2007, the contribution rate has been increased to 24% but enterprises are authorized to keep part of the contributions (2 p.p.) in reserves so as to be able to pay employees short-term social security benefits in the forms of sickness, maternity and paternity benefits. The share of the contributions in total wages will, consequently, be reduced to 22%.

Surprisingly, the share of contributions in total wages is abnormally low in the public sector (7.6 percent) as well as in the private sector (9.5 percent in the case of FDI enterprises and 5.9 percent in the other enterprises). Part of the explanation is likely that some enterprises transferred to the Vietnam Social Security only a portion of the contributions due because of financial difficulties or occasionally in order to avoid a delay in the payment of the social security benefits to the employees that are on sick leave or maternity leave<sup>1</sup>. These events, by themselves, cannot explain, however, why a majority of enterprises contribute very low shares of the total wages to the Vietnam Social Security as shown in Figures 1 and 2 below.

	Amount of Contributions paid to VSS (billion VND) (C)	Employees total remunerations <sup>a</sup> (billion VND) (Wb)	Contribution Shares (%) (shC)
Total	8,943	118,412	7.6
Public	3,631	48,057	7.6
Central State Enterprises	1,950	29,435	6.6
Local State Enterprises	817	8,391	9.7
Joint Stock with Public Capital (>50%)	863	10,770	8.0
Private	2,254	38,247	5.9
Collective	41	920	4.5
Private	104	2,559	4.1
Private Limited Companies	891	18,579	4.8
Joint Stock with Public Capital (<50%)	644	7,779	8.3
Joint Stock no Public Capital	573	8,380	6.8
Foreign-Invested	3,058	32,108	9.5
100% foreign	2,374	24,349	9.7
Joint venture	658	7,757	8.5

## Table 3Average share of Contributions in Total Wages by Ownership

Source: Authors' calculation based on the Census

Notes: (a) in some enterprises, the study assumes that all employees are not registered to the Vietnam Social Security. More details are provided in annex 1.

Figure 1 shows that more than half of the enterprises (66.93 percent) contribute as low an amount as less than 5 percent of the wages they pay. Only a very small number (3.47 percent)

<sup>1.</sup> As mentioned in Box 2, the 2006 law foresees the retention of part of the contributions by enterprises. We do not know, however, if a similar practice was allowed before. In any case, it would explain a much lower reduction of the share of the contributions in wages that the one that is effectively observed.

of the enterprises contribute 23 percent, in which only 1.8 percent contribute more than 23 percent.



### Figure 1: Observed share of contributions in total wages: Percentage of enterprises by levels of contributions

Figure 2 shows the number of employees that are affected by such a behavior by firms. The results are highly alarming: about 3.2 million people are employed by enterprises whose contributions make up less than 10 percent of the wages.



### Figure 2: Observed share of contributions in total wages: Number of employees by levels of contributions

This shows that enterprises either do not register all their employees to the Vietnam Social Security or do not report fully the wages they effectively pay their employees (or both). Both are very possible in the context of Vietnam. First, employees with labor contracts shorter than 3 months are not registered to the Vietnam Social Security. Second, contributions are calculated not based on the total amount of wages that enterprises report to the tax authorities but based on the wages recorded in employees' labor books, i.e. the wages agreed upon at the time labor contracts were first signed. These amounts are usually not revised when employees' wages are increased. As a result, over time, the wages recorded in labor books fail to reflect actual increases in the actual current wages received by employees. Hence, the share of contributions paid to the Vietnam Social Security in current wages tends also to decline over time until the level of the wage reported in the labor book hits the level of the legal minimum wage. Figures 3 and 4 give an illustration of that process.



Figure 3: Illustration of the falling share of labor book wages in current wages

Figure 4: Illustration of the falling share of contributions in current wages



Figure 3 shows the increasing gap between one's current wage and the wage reported in his labor book as the date the labor contract was signed draws further. The initial wage recorded in the labor contract is not revised until its level reaches the level of the legal minimum wage that is the wage floor for contributions to be paid (in year 8 in Figure 3). As a result, as can be seen in Figure 4, the share of contributions in current wages steadily falls from 23 percent in year 1 (when the labor contract is first signed) to 10 percent in year 11. The fall is slowed down after the labor book wage reached the level of the minimum wage and increases afterward at the same speed.

The following section evaluates the importance of these two factors.

# 4. Employee Registration and Wage Reporting to the Vietnam Social Security

Two approaches help estimate the relative number of short-term employed workers that are not registered to the Vietnam Social Security. The first one is based on implications resulting from the obligation to contribute at least 23 percent of the minimum wage imposed on each worker. The second one compares the number of employees working in enterprises listed in the Enterprise Census to the number of employees officially registered to the Vietnam Social Security. The combined results of both approaches indicate that short-term employees represent roughly 18.2 percent (882,351 people) of the total employment (which excludes employees of the enterprises that did not contribute at all to the Vietnam Social Security).

The first approach studies implications of the minimum level of contribution imposed on workers. Legally, the minimum level of contribution per worker is 23 percent of the minimum wage in the respective year. Some enterprises listed in the Enterprise Census report lower levels. One possibility is that these enterprises hire part-time workers; however, such a practice is rare in Vietnam. Another possibility is that a portion of the employees were newly-hired or newly-fired during the year. Since only the employees with long commitments to enterprises are likely to be registered to the Vietnam Social Security, the study assumes that these newly-hired or newly-fired workers are not registered. Accordingly, the study postulates that the number of employees registered to the Vietnam Social Security by enterprises is the number that satisfies the requirement for the average contribution per employee to be 23 percent of the minimum wage in the respective year.

Let N be the total number of employees reported by enterprises, B the total amount of wages and C the level of contributions. If w is the minimum wage, the average contribution per worker should be at least 23 percent of the minimum wage (equation 1). If this condition is not verified, then the number of employees registered to the Vietnam Social Security N\* is given by the equation (2).

(1) 
$$\frac{C}{N} \ge 0.23 * w$$
  
(2) If  $\frac{C}{N} < 0.23 * w$  then  $N^* = \frac{C}{0.23 \cdot w}$ 

Based on the information presented in Table 4, it appears that 65.9 percent of enterprises (mostly from the private enterprises with 72 percent) do not satisfy (1).

Period	Domestic	FDI region 1	FDI region 2	FDI region 3
Jan-Sept	290	626	556	487
Oct-Dec	350	626	556	487
Yearly average	305	626	556	487

Table 4Level of the minimum wage in Vietnam in 2005 in thousand VND

<u>Note:</u>

<u>Region 1</u> includes FDI enterprises in the urban districts of Hanoi and Ho Chi Minh City. <u>Region 2</u> includes FDI enterprises in the suburban districts of Hanoi and Ho Chi Minh City and the urban districts of Hai Phong; Ha Long (Quang Ninh province); Bien Hoa, Long Khanh, Nhon Trach, Long Thanh, Vinh Cuu and Trang Bom (Dong Nai province); Thu Dau Mot, Thuan An, Di An, Ben Cat and Tan Uyen (Binh Duong); and Vung Tau (Ba Ria - Vung Tau province). <u>Region 3</u> includes all other areas.

In these enterprises, the average contribution per worker is lower than 23 percent of the annual average wage. In order to legalize their behavior, enterprises adjust the number of employees to be registered to the Vietnam Social Security such that the amount of contribution per registered worker is still equal to 23 percent of the minimum wage in the respective year.

As the figures in Table 5 indicate, this adjustment reduces the number of employees likely to be registered to the Vietnam Social Security from 4,852,942 to 3,970,591. According to this estimate, about 882,351 employees were likely to be short-term employees.

1. Total number of employees	
Enterprise sector	4,852,942
+ State sector	1,598,796
+ Private sector	2,001,894
+ FDI	1,252,252
2. Total number of employees likely to be registered	
Enterprise sector	3,970,591
+ State sector	1,451,039
+ Private sector	1,416,344
+ FDI	1,103,208
3. Total number of employees likely to be hired under short-term contracts	
Enterprise sector	882,351
+ State sector	147,757
+ Private sector	585,550
+ FDI	149,044

Table 5Estimate of employees under short-term contracts (1)

The second approach compares the number of workers likely to be registered to the Vietnam Social Security obtained in Table 5 to the official number of contributors. The Vietnam Social Security provides statistics of employees' registration by ownership. However, in the public sector, the VSS does not distinguish the employees in the enterprise sector from the employees in the administration<sup>1</sup>. Therefore, in Table 6, the number of the employees in the administration is obtained from the Ministry of Labor, Invalids and Social Affairs. It corresponds to the total of number of people employed in the sectors of education and training, healthcare, social services, as well as in Party organization and activities. Since statistics of the Ministry of Labor, Invalids and Social Affairs of the figure recorded in Table 4 over-estimates the number of the public employees in the administration<sup>2</sup>. Based on this estimate, the number of employees working in the enterprise sector that are registered to the Vietnam Social Security is estimated to be 3,742,119. An additional number of 228,472 people would be short-term employees.

<sup>1.</sup> As a result, there is a difference in the sum of contributions according to the Census (8,943 billion VND) and according to VSS data (14,483 billion VND).

<sup>2.</sup> As these sectors are largely dominated by the public sector, the error is expected to be relatively small.
1. Total number of employees likely to be registered <sup>a</sup>	3,970,591			
1.1. Private sector	1,416,344			
1.2. FDI	1,103,208			
1.3. State sector	1,451,039			
2. Total number of employees officially registered <sup>b</sup>	6,226,991			
2.1 Central Government, Army, Finance, Education etc. <sup>c</sup>	2,484,872			
2.2 Enterprise sector = (2) - (2.1.)	3,742,119			
2.2.1. Private sector	1,374,261			
2.2.2. FDI	1,124,566			
2.2.3. State sector = (2.2) - (2.2.1) - (2.2.2.)	1,291,915			
3. Additional number of employees likely to be hired under short-term contracts				
3.1 Enterprise sector	228,472			

Table 6Estimate of employees under short-term contracts (2)

Source: (a) Enterprise Census (b) Vietnam Social Security (c) Ministry of Labor, Invalids and Social Affairs.

If we combined the findings obtained from these two approaches, about 1,110,823 employees (= 882,351+228,472) or 22.9 percent of the employees in formal sector enterprises are not registered to the Vietnam Social Security, most likely because they are hired on short-term contracts.

Based on the estimate of the number of employees hired under short-term contracts and therefore not registered to the Vietnam Social Security, it is possible to estimate the relative size of the gap between reported and current wages. The results are presented in Table 7 in which the number of employees registered by ownership corresponds to the number recorded in the second section of Table 6. Unfortunately, the estimate is unable to take into account the fact that the average wage of these workers is possibly lower than that of registered workers. On average, reported wages are shown to be equal to less than half of current wages (42.6 percent). By ownership, the gap is the largest among private enterprises (reported wages equal to only 37.3 percent of current wages).

1. Total reported contributions (billion VND)						
Enterprise sector	8,943					
+ State sector	3,631					
+ Private sector	2,254					
+ FDI	3,058					
2. Estimated number of employees registered to Vietnam Social Security						
Enterprise sector	3,742,119					
+ State sector	1,291,915					
+ Private sector	1,374,261					
+ FDI	1,124,566					
3. Average reported wage (thousand VND)						
Enterprise sector	866					
+ State sector	1,018					
+ Private sector	594					
+ FDI	985					
4. Average current wage (thousand VND)						
Enterprise sector	2,033					
+ State sector	2,505					
+ Private sector	1,592					
+ FDI	2,137					
5. Ratio of the reported wage to current wage (%)						
Enterprise sector	42.6					
+ State sector	40.6					
+ Private sector	37.3					
+ FDI	46.1					

### Table 7Estimation of the gap between reported and current wages

Figures 3 and 4 show that about 42 percent of enterprises, which cover about 40 percent of the labor force, report only 20-40 percent of employees' wages to VSS. In addition, roughly 33 percent of enterprises, which cover about 16 percent of the labor force in the enterprise sector, report even less than 20 percent. Meanwhile, only 7 percent of enterprises, which cover 10 percent of the labor force, report more than 80 percent of employees' wages to VSS.



## Figure 5: Percentage of enterprises by observed ratio of reported wage to current wages

#### Figure 6: Percentage of total employees by observed ratio of reported wages to current wages



#### 5. Enterprises and Employees' Revealed Preferences

The analysis in the previous section indicates that numerous enterprises do not register their employees to the Vietnam Social Security, and among those which register their workers, under-reporting wages is quite common. These behaviors clearly undermine the main objective of social insurance programs to reduce the income shock due to the incapacity to work. If employees are not covered, employees are not insured. And even when insured, the levels of benefits available from the Vietnam Social Security are insignificant in relation to the income shock the employees could face. A discernible percentage of the employees are not covered, and of the registered, a relatively considerable percentage of the employees are covered by contributions made on income levels that reflect less than half of their current wages.

This lack of coverage seems inconsistent with the idea that social insurance is beneficial to employees. At the first glance, the causes of the lack of coverage seemed entirely institutional: the size of the labor force employed under short-term contracts was large, and the practice by both enterprises and the Vietnam Social Security of paying and collecting contributions based on the wages reported in labor books was widespread. These factors certainly play a part, but they are unsatisfactory in explaining why coverage is still so limited if social insurance is indeed so beneficial. A second group of explanations points out that many workers are not aware of their social rights and that enterprises take advantage of this to avoid paying social taxes to increase own revenues. Public awareness campaigns and measures to strengthen law enforcement would help increase coverage in this context. The impact of these policies could be very limited, however, if the causes are more of enterprises and employees' economic interests. By evading entirely or reducing the amount of contributions, enterprises may be able to increase their revenues while employees may also be able to take higher net wages home.

Let's assume that an enterprise hires a worker at the time period t. The employee's net wage reported in his labor book is 100 and at the time period t, the enterprise contributes 23 to the Vietnam Social Security. The overall labor cost (or the gross wage) is 123. The employer possibly receives some capital income (from the capital invested in the enterprise) and some labor income (for managerial activities).

Let's assume that at the time period t+1 the enterprise's labor productivity increased by 20 percent. Under such circumstances, all labor incomes in the enterprise can increase by the same amount. Several scenarios are possible. They are described in Table 8.

As the enterprise labor productivity increased by 20 percent, the enterprise is able to bear an increase of its labor cost by 20 percent from 123 to 147.6. If contributions were paid on current wages (like in the first scenario) the enterprises would increase both the net wage and the amount of contributions by 20 percent. In practice, the level of the contributions usually remains unchanged. The surplus (4.6 = 27.6 - 23.0) is possibly captured by the enterprise (scenario 2), paid to the employees in the form of higher net wages (scenario 3) or shared (scenario 4).

Scenario	Labor cost/ Gross wage	Social contributions	Net wage taken home	Employer's extra revenue
0. Initial period	123	23	100.0	0
1. No evasion	147.6	27.6	120.0	0
2. Employer's capture	147.6	23	120.0	4.6
3. Employee's higher net wage	147.6	23	124.6	0
4. Sharing	147.6	23	122.3	2.3

#### Table 8

Scenarios 2 and 4 are, in theory, only possible in the short and medium terms. Under perfect competition and perfect labor mobility, employees will move to whichever enterprises that can offer them the highest net wages, like in scenario 2. As L. Summers (1989) explains, employees will not be willing to work in enterprises that pay contributions if social security benefits are deemed unworthy by them. In the example above, employees will only stay in enterprises that pay contributions on current wages (scenario 1) if they deem the *additional* benefits from the Vietnam Social Security worth the amount of *additional* contributions the enterprise will deduct from their net wages (i.e. 4.6 in the example).

If scenario 3 is more likely than scenario 2 or scenario 4, public awareness campaigns will have little impact on coverage and any law enforcement policy risks being very unpopular among employees.

The econometric analysis presented below seeks to study the patterns of participation and wage reporting as well as enterprise revenues to understand how much the low coverage observed in Vietnam is due to institutional factors such as the lack of knowledge or the low appreciation of social insurance benefits.

The model reposes on the hypothesis that if all enterprises registered their employees to the Vietnam Social Security and paid contributions on current wages, the variance of average wage as well as the variance of average revenue of enterprises would not be as large as effectively observed. So, the relative levels of net wages and enterprise revenues per employee in the same branch (or industry) reflect the behavior of employees and enterprises toward the Vietnam Social Security. Under perfect competition, enterprises in the same branch should bear about the same levels of labor unit costs. Not all employees necessarily take home the same net wages, however. Enterprises that do not register their employees for social security can pay the highest net wages. Enterprises that do register their employees but don't pay contribution on current wages pay lower net wages than the previous group of enterprises can but still pay higher wages than enterprises that contribute on current wages can.

As time passes and the reported and the current wages diverge further, employees working in enterprises that do not contribute on current wages should be able to take home relatively higher wages than those working in recently-established enterprises. The model expects therefore a negative relationship between the relative wages of an enterprise i in a branch j and the ratio of reported wages to current wages of that enterprise. The second possibility is that enterprises' evasion practice actually benefits enterprises instead of workers. If workers are not aware of their social rights or desire to participate in social security but are somehow unable to move to enterprises that pay contribution on current wages, scenario 1 will not be observed. These employees receive net wages as low as those in the formal sector while enterprises capture the unpaid contribution amounts. In that context, enterprises that do not register employees or do not pay contributions on current wages are expected to report higher revenues per worker than the other enterprises in the same branch. The model, therefore, expects a negative relationship between the relative size of enterprises' average revenue per worker per branch and the ratio of reported wages to current wages of that enterprise.

Other enterprise characteristics,  $X_{i,n}$ , such as percentage of women employees, location, size of the enterprise and type of ownership potentially affect employees and enterprises' behavior regarding social security. They are included in the estimation.

The study, accordingly, estimates the two following relationships:

(3) 
$$W_{i,j} = a_1 \cdot \left(\frac{W_{SSi}}{W_i}\right) + \sum b_{1,n} \cdot X_{i,n}$$

(4) 
$$\left(\frac{R}{E}\right)_{i,j} = a_2 \cdot \left(\frac{W_{SS}}{W_i}\right) + \sum b_{2,n} \cdot X_{i,n}$$

where  $W_{ssi}/W_i$  is the ratio between the average reported and the average current wages of enterprise i and,  $(R/E)_i$  is the average revenue per worker of enterprise i of branch j. The coefficients  $c_1$  and  $c_2$  are expected to be negative if, through evasion, employees and enterprises obtain higher net wages and higher revenue per worker respectively as compared to other enterprises in the same branch. The estimation, accordingly, is done using random/fixed effects. The results are presented in Table 9.

The study uses also a multinomial logistic regression to verify if enterprises that evade social security registration indeed report higher net wages or average revenue per worker. In the first group, enterprises do register their employees but do not pay contributions on current wages. In the second group, enterprises report higher net wages or higher average revenue per workers but pay contributions on current wages.

The model, therefore, classifies the enterprises into 3 groups. The first group, G1, includes enterprises that do not register their employees. The second group, G2, includes enterprises that do register their employees but do not pay contributions on current wages. The third group, G3, includes enterprises that do register their employees and contribute on current wages<sup>1</sup>. The model expects that in the same branch, the relative size of both net wages and the average revenue per worker is higher in G1 as compared to in G2; similarly, higher in G2 as compared to in G3.

<sup>1.</sup> This group includes recently established enterprises for which current wages are still equal to the reported wage but not by choice.

The results are presented in Table 10. In this table, G2 and G3 have been divided into two groups, G4 and G5 which include those enterprises that appear to report only a portion of their employees and most likely pay contributions on the minimum wage. G2 includes the enterprises in which the current average wage is higher than the minimum wage. G3 includes the enterprises in which the current average wage is lower than the minimum wage.

# Table 9Relative average wage, relative average revenue per worker and the ratio<br/>of the average reported wages to average current wages<br/>Random/fixed effects model by branch

Dependent variable (log)	Average wage			Average revenue per worker		
	Coefficient	95% confidence interval		Coefficient	95% confidence interval	
Ratio of average reported wages to average current wage	-0.38	-0.39	-0.36	0.82	0.80	0.85
In private sector	-0.25	-0.27	-0.23	-0.27	-0.31	-0.23
In FDI sector	0.36	0.34	0.39	-0.38	-0.43	-0.33
Share of women	0.01	0.00	0.01	0.02	0.01	0.03
Number of employees (log)	0.06	0.06	0.07	-0.16	-0.17	-0.15
Share of taxes in revenue	0.05	0.04	0.05	-0.22	-0.22	-0.21
In region 2	-0.10	-0.12	-0.09	-0.07	-0.10	-0.05
In region 3	-0.33	-0.34	-0.33	0.00	-0.01	0.02
Constant	13.23	13.20	13.27	-8.57	-8.74	-8.41
Revenue per worker (log)	0.24	0.24	0.25			
Average wage (log)				0.94	0.93	0.95
Sigma_u	0.239			0.868		
Sigma_e	0.477			0.934		
Rho	0.201			0.463		
Number of observations	120571			120571		
Number of groups	604			604		
Average number of observations per group	199.6			199.6		
R-squared within	0.3410			0.3141		
between	0.4213			0.2791		
overall	0.2856			0.2793		

*Note: all coefficients are at 0.01 level of significance except the coefficients attached to the share of taxes in revenues* 

#### Table 10

#### Social security participation profile, relative average wage and relative average revenue per worker per branch Multinomial logistic regression

	Group 2	Group 3	Group 4	Group 5
Ratio of average current wages to branch's average current wages	0.55	-1.19	0.01	-7.48
In private sector	-4.55	-5.50	-1.65	-3.76
In FDI sector	-1.88	-3.23	-0.47	0.04*
Ratio of average revenue per worker to branch's average revenue per worker	0.09	0.09	0.03	0.06
Share of women	0.57	0.81	-0.03	-2.96
Ratio of number of employees to branch's average number of employees	0.18	0.18	0.12	0.18
Proportion of taxes in revenues	-0.02**	0.02***	-0.38	-0.51*
In region 2	-0.61	-0.55	-0.83	0.01***
In region 3	-1.29	-0.15*	-1.54	0.43
Constant	2.66	1.47	1.77	3.44

Group 1 is the base outcome.

Group 1: enterprises that do not register employees for social security

Group 2: enterprises that do not pay contributions on current wages

Group 3: enterprises that pay contributions on current wages

- Group 4: enterprises that do not register all employees, do not pay contributions on current wages, and are likely to pay contributions on minimum wages
- Group 5: enterprises that do not register all employees, are likely to pay current wages equal to minimum wages and so, pay contributions on current wages.

Number of observations	123629		
Pseudo R2	0.1467		

Note: all the coefficients are at 0.01 level of significance except (\*) at 0.05 level of significance, (\*\*) at 0.10 level of significance, and (\*\*\*) no level of significance specified.

The results in Table 9 show a negative association between enterprises' average wage and the ratio of the average reported wage to the average current wage within all branches. Workers that work in enterprises practicing evasion receive higher net wages. To the opposite, the results show a positive association between enterprises' average revenue per worker and the ratio of the average reported wage to the average current wage. Enterprises practicing evasion do not seem to be able to capture the unpaid contribution amounts to realize extra revenues. However, the conclusion is not strong because the results also show in both estimations a positive relationship between the relative average wage and the average revenue per worker for enterprises.

The coefficients reported in Table 10 indicate that employees with the highest net wages are most likely working in enterprises that do not pay contributions on current wages (G2). If enterprises that do not register employees to VSS did not capture any of the contributions to realize additional revenues, highest net wages should be delivered to G1 (in which case the coefficient attached to the net wages in G2 would be negative and higher than in G3). That the employees with the highest net wages are not those in G1 suggests that employees working in enterprises that are not registered for social security are possibly in a weaker position as compared to their employers. Not only do they not have their social rights respected but they also receive relatively lower wages than their counterparts in other enterprises do. As expected, employees with the lowest net wages are most likely working in enterprises belonging to G3 (which pay contributions on current wages). The coefficient attached to the workers of G5 is particularly low because they work in enterprises in which the average wage is below the minimum wage.

The results regarding whether enterprises benefit from under-reporting are less clear. The coefficients attached to the average revenues per worker of enterprises in G2 and G3 are the same and higher than the corresponding coefficient in G1 (the base outcome group, supposedly with coefficients being 0). While employees in G1 receive relatively lower wages, enterprises in group 1 still do not realize higher average revenues per worker. This suggests that these enterprises are perhaps less efficient than the other enterprises in the same branch.

The coefficients attached to the other variables indicate that working in the private sector (FDI or otherwise) decreases the likelihood of being registered for social security and of having contributions paid on current wages if registered. To the opposite, being employed in enterprises with a higher share of women increases the likelihood of being registered and having contributions paid on current wages. The size of the firm does increase the likelihood of being registered as well. Finally, enterprises' tax burden, measured by the ratio of the proportion of total tax in total revenue, does not seem to have any impact.

#### **6. Social Implications**

Enterprises and employees' weak inclination to contribute on current wages has important social implications. First, it contributes to the public mindset that social security is unable to provide "helpful" benefits. Second, it brings about leakages in the social security policy being implemented toward low income earners.

Enterprises and employees' weak inclination to contribute on current wages further entrenches in the public mindset the idea that social security is unable to provide "helpful" benefits. For example, according to the Social Security Law, sickness benefits are equal to up to 75 percent of the wage earned in the previous month. This regulation aims at avoiding a large drop of income in times of sickness. The impact in reality is very different. If the reported wages only equal to 42.6 percent of current wages (the average level shown in Table 7), social security benefits will replace only 37.1 percent of a sick worker's current wage. This problem affects all types of social insurance benefits. Old-age pensions, as a result, in many cases replace a very small part to the pre-retirement income. That the majority of pension levels are very low will become evident when, around 2015<sup>1</sup>, the first group of workers who will have had contributed

<sup>1.</sup> Workers who started contributing in 1995 will have contributed for 20 years in 2015. All workers who have only contributed to the private sector and retire before that year are not entitled to monthly pension benefits.

for 20 years from the private sector will start retiring with pensions as low as 20.3 percent of their average income (= 55 percent of 36.9 percent).

Not only do workers have to suffer a large income shock during their sick leaves or at retirement but their friends and relatives also judge that social benefits are useless. This frustration convinces workers that the value of social benefits is low and unworthy of higher levels of contributions. As Perry observes, high informality often induces "a blunt societal indictment of the quality of the state's service provision".

Enterprises and employees' weak inclination to contribute on current wages creates leakages in the social security policy being implemented toward low income earners. According to the Social Security Law, all employees (who are registered in the mandatory scheme) are entitled to a minimum pension equal to the minimum wage if they have contributed for at least 20 years.

A worker's pension benefit is, therefore, the maximum between the result of the pension formula and the minimum pension.

(5) Pk = Max (rWk, MinP)

where  $P_k$  is the pension paid to a worker k, W the average reported wage used in the calculation, r the percentage of that income replaced by the pension benefit and MinP the minimum pension

The result of the equation (x) is determined by the minimum pension when:

(6) rWk < MinP

Given that the minimum pension is equal to the minimum wage, the worker k will receive the minimum pension if:

(7) 
$$Wk < \frac{1}{r}MinWage$$

For example, workers with 20 years of contribution are entitled to a pension of 55 percent of their reported wages (r = 0.55). All workers that have a reported wage under 1.82 (= 1/0.55) times the minimum wage will be entitled to the minimum pension benefit equal to the minimum wage. Workers entitled to the maximum replacement rate of 75 percent will be able to obtain a pension equal to the minimum wage when their average reported wage is under 1.3 (=1/.75) times the minimum wage.

Social security subsidizes low income earners under the assumption that they do not have enough savings to complement pension income during retirement. However, this gap between reported and current wages creates major leakages in that policy. Many workers entitled to the minimum pensions are in reality not low income earners. Their average current wages are higher than 1/r of the minimum wage.

This leakage is crucially important. It is symptomatic that in the database of the Enterprise Census, 3.1 percent of the enterprises report average current wages under the threshold of 1.3 times the minimum wage but they all do report average wages below.

#### Table 11

#### Enterprises with average wage lower than 1.3 times minimum wage and enterprises reporting average wage lower than 1.3 times the minimum wage

	Total number of enterprises reporting to VSS	in which aver wage is lower t minimu	rage current han 1.3 times m wage	in which aver wage is lower t minimu	rage reported than 1.3 times m wage
		number	%	number	%
State sector	3,222	82	2.5	428	13.3
Private sector	52,667	1,669	3.2	41,883	79.5
FDI	3,457	77	2.2	1,361	39.4
Total	59,346	1,828	3.1	43,672	73.6

Source: Authors' calculation based on the Census

#### Table 12

#### Employees in enterprises with average wage lower than 1.3 times minimum wage and employees in enterprises reporting average wage lower than 1.3 times minimum wage

	Total number of enterprises reporting to VSSin which average current wage is lower than 1.3 times minimum wage		in which aver wage is lower t minimu	age reported han 1.3 times m wage	
		number	%	number	%
State sector	1,598,796	44,100	2.8	385,017	24.1
Private sector	2,001,894	80,653	4.0	1,231,175	61.5
FDI	1,252,252	31,792	2.5	633,629	50.6
Total	4,852,942	156,545	3.2	2,249,821	46.4

Source: Authors' calculation based on the Census

This leakage problem has important financial implications. The provision of minimum pensions implies transfers of resources from average and high income earners to low income earners. If only the pension formula was used to calculate pensions while keeping all things equal, low income earners would receive lower pensions thus leaving more "unused" resources; hence, a more generous pension formula could be applied, for example. To the contrary, the payment of the minimum pension to retirees who are not low income earners raises financial concerns. It raises the amount of resources needed to finance the policy significantly; thus, in turn it has to oblige to introducing less generous pension formulas to "free up" more resources to finance the minimum pension.

#### 7. Conclusion

This study investigated enterprises' VSS registration patterns and employee's preferences regarding social insurance. The results show strong evidence that in the same industry, employees working in enterprises that evade (registration or contributions) receive higher net wages than employees working in enterprises that do not evade. The main reason for evasion does not seem rooted, therefore, solely in enterprises' will to obtain higher revenues per worker. These results corroborate the view that in Vietnam, workers collude with employers to evade social insurance contributions (Dao Quang Vinh, 2008).

Employees' lack of understanding of social insurance is probably one of the primary causes of such behaviors. Employee's low regard for social insurance is probably another important factor. As L. Summers (1989) explains, employees are not willing to work in enterprises that pay contributions if social security benefits are deemed unworthy by them. As Perry observes in a review of issues related to the informal sector in Latin America, this view suggests that high informality results in a blunt societal indictment of the quality of the state's service provision.

Which of these factors is currently dominating in Vietnam is difficult to say. It is likely, however, that in the absence of reforms, the population's dissatisfaction with social insurance services will steadily grow in the future. Employees' reported wages are so low that social insurance benefits cannot prevent huge income drops in cases of sickness, maternity or retirement. Evidence that social insurance benefits are unhelpful will be growing more apparent as employees who have only worked in the private sector become pensioners in the near future. It is very possible that, in many cases, pension benefits will replace less than 20 percent of the employee's pre-retirement average income. Pensioners' frustration will convince current workers that the value of social benefits is low and that they do not deserve higher contributions.

The irony of the situation is that while the population will show increasing disregard for social insurance, abnormally large amounts of resources will be pumped in to provide minimum pensions. Initially designed to provide higher replacement rates to low income earners, this policy will benefit a much larger group of workers that have reported particularly low wages but were actually paid higher amounts. This lack of balance between pension benefits and contributions will erode the financial sustainability of the system and further convince the public that VSS, as an institution, is rather weak in managing the pension system.

Changing enterprises' and employee's attitudes toward social security is crucial if the government desires to build a financially sustainable social security system that achieves large coverage rates. Law enforcement policies will probably have limited impact if other policies are not in place so as to increase employees' awareness of their social rights and of the consequences of wage under-reporting.

#### **Annex 1. Some Further Technical Details**

Some enterprises report levels of contributions that appear inconsistent with the number of employees they report and the legal minimum wage. Legally, the minimum level of contribution per worker must be 23 percent of the minimum wage in the respective year. One possibility is that these enterprises hire part-time workers; however, such a practice is rare in Vietnam. Another possibility is that a portion of the employees were newly-hired or newlyfired during the year. Since only the employees with long commitments to enterprises are likely to be registered to the Vietnam Social Security, the study assumes that these newly-hired or newly-fired workers are not registered. Accordingly, the study postulates that the number of the employees registered to the Vietnam Social Security by enterprises is the number that satisfies the requirement for the average contribution per employee to be 23 percent of the minimum wage in the respective year.

Let N be the total number of employees reported by the enterprises, B the total amount of wage and C the level of contributions. If w is the minimum wage, the average contribution per worker should be at least 23 percent of the minimum wage:

(1) 
$$\frac{C}{N} \ge 0.23 * w$$

Based on the information presented in Table A1, it appears that 39,109 enterprises (65.9 percent of the total number of enterprises in the Census) do not satisfy (1).

Period	Domestic	FDI region 1	FDI region 2	FDI region 3
Jan-Sept	290	626	556	487
Oct-Dec	350	626	556	487
Yearly average	305	626	556	487

Table A1Level of the minimum wage in Vietnam in 2005 in thousand VND

<u>Note:</u>

<u>Region 1</u> includes FDI enterprises in the urban districts of Hanoi and Ho Chi Minh City. <u>Region 2</u> includes FDI enterprises in the suburban districts of Hanoi and Ho Chi Minh City and the urban districts of Hai Phong, Ha Long (Quang Ninh province); Bien Hoa, Long Khanh, Nhon Trach, Long Thanh, Vinh Cuu and Trang Bom (Dong Nai province); Thu Dau Mot, Thuan An, Di An, Ben Cat and Tan Uyen (Binh Duong); and Vung Tau (Ba Ria - Vung Tau province). <u>Region 3</u> includes all the other areas.

In these enterprises, the average contribution per worker is lower than 23 percent of the annual average wage. In order to legalize their behavior, enterprises adjust the number of employees to be registered to the Vietnam Social Security to N\* such that the amount of contribution is still equal to 23 percent of the minimum wage.

(2) If 
$$\frac{C}{N} < 0.23 * w$$
 then  $N^* = \frac{C}{0.23 * w}$ 

As the figures in Table A2 indicate, this adjustment reduces the number of employees likely to be registered to the Vietnam Social Security from 4,852,942 to 3,970,591.

## Table A2Adjustment of the number of employees to be registered(Enterprises that contribute to the Vietnam Social Security only)

1. Total number of employees					
Enterprise sector	4,852,942				
+ State sector	1,598,796				
+ Private sector	2,001,894				
+ FDI	1,252,252				
2. Total number of employees adjusted for the difference between the level of contributions and the obligation to pay workers at least the legal minimum wage					
Enterprise sector	3,970,591				
+ State sector	1,451,039				
+ Private sector	1,416,344				
+ FDI	1,103,208				

The figures in Table A2 give a rough estimate of the number of workers with short-term contracts which is about 18.2 percent [=  $(4,852,942 - 397,059) \times 100 / 4,852,942$ ] of the total number of employees.

### 8

### Social Allowance Policy and the Poor: Assessing Potential Impacts of Decision 67

Paulette Castel, Pham Anh Tuyet

#### 1. Introduction

A wide range of public policies aims at improving the social welfare of the population or specific groups among the population have been implemented by the Government. The use of the term *social protection* usually refers to the group of social policies that provide cash transfer to protect households from poverty. These policies are of two types. *Social and health insurance policies* are concerned about how to mitigate households' loss of welfare in case of unexpected health expenditure or loss of labor income due to various reasons such as family member's sickness, maternity leave, unemployment, disability, old-age or death. *Social assistance policies* are designed to help poor households to satisfy their basic needs and to avoid deep or extreme poverty. Following S. Sumarto, A. Suryahadi, L. Pritchett (2000<sup>1</sup>)'s illustration, one can think of social protection policies as ropes helping people to reduce the decrease in welfare caused by the loss of income and social assistance policies with different goals, such as social allowances to meritorious persons, education fees subsidies granted to poor students, preferential access to credit or the development of infrastructure in poor regions, are not part of the social protection system.

According to this definition, social assistance policies in Viet Nam include programs which provide social allowances to the poor and the payment of emergency allowances in case of natural disaster.

Since 2007, the government has indicated its willingness to develop and increase the impact of social allowances. The regulations were amended in April 2007 and the budget in 2008 was expanded to VND million 2,100 from VND million 510 in 2007 (or approximately from 0.05 percent to 0.15 percent of GDP).

<sup>1.</sup> S. Sumarto, A. Suryahadi, L. Pritchett, World Bank Policy Research Working Paper 2436, 2000.

The goal of this study is to measure the possible impacts of these new policies. Due to the recently passed regulations and few available administrative data, the study cannot report on the effective impact of the new policy. The approach uses instead the 2006 VHLSS to estimate the new policy efficiency as if it had enough resources to be fully implemented without any restriction.

The first section measures how many of the poor could be eligible to social allowances if Decision 67 was to be fully implemented. The second section describes the characteristics of the poor that would probably not benefit from this new policy.

#### 2. New Policy on Social Assistance Allowances: Decision 67

Decision 67/2007/ND-CP of April 2007 introduced changes in the categorization of beneficiaries of social assistance allowances as well as the level of allowances. In brief, the new group of beneficiaries includes:

- the children with no one to rely on, AIDS/HIV-infected children living in poor households,
- the poor elderly with no one to rely on,
- the elderly aged 85 and above who are not pensioner or beneficiary from other special social monthly benefit
- the mentally or physically severely disabled persons living in poor households (including AIDS/HIV-infected persons),
- the poor people raising children alone, as well as,
- the families with an adopted child and families with at least two disabled members.

An important change compared to the previous regulations is that Decision 67 targets "the poor" instead of the persons "without any source of income". Some groups are defined even more broadly than before. The new regulation includes the elderly of 85 years and above while before, it covered only those of 90 years and above. All households with two or more severely disabled persons are included regardless of the cause of disability while before were included only those affected by the "agent orange". Finally, children whose parents are in prison can now also be considered as children with no one to rely on.

The amount of allowance has been increased from between 65,000 and 260,000 VND per month to between 120,000 and 480,000 VND per month.

Finally an "emergency" payment is realized in case of unexpected economic difficulties, after events such as: the death or injury of a household member, hunger related to natural disaster or extreme poverty.

All beneficiaries are exempted from educational fees and benefit from free health insurance. Similar social allowances are also paid to the community-based social houses where some of the beneficiaries live.

<sup>1.</sup> Toxic chemicals spread in Viet Nam during the US – Viet Nam war.

According to MOLISA administrative figures reported in Table 1, about 1.15 million people may potentially be eligible for social allowance in 2008. In order to achieve a higher coverage than preceding years, the budget assigned to the distribution of social allowances is 3.5 times higher than the budget of 2007.

	2000	2001	2002	2003	2004	2005	2006	2007	2008
Potential and effective number of beneficiaries in thousand and corresponding coverage in percent									
potential	480.0	488.7	489.0	546.2	843.0	831.0	860.0	1100.0	1150.0
effective	175.4	181.6	223.0	229.0	329.7	416.0	470.0	578.0	
coverage	36.5	37.2	45.6	41.9	39.1	50.1	54.7	52.5	
Budget									
VND billion	123.1	127.51	173.96	160.78	282.9	421.8	510.0	590.0	2100.0
in % of GDP	0.03	0.03	0.03	0.03	0.04	0.05	0.05	0.05	

 Table 1

 Social Assistance administrative data Number of beneficiaries and budget

*Source: Nguyen Hai Huu "Social assistance for the poor fact and measures" presentation made at the workshop on social protection policies for the poor Molisa - DFID Hanoi June 10, 2008.* 

#### 3. Possible Impact of Decision 67 on Poverty: the Approach

It is right now impossible to measure the impact of the implementation of Decision 67. Data on poverty and household characteristics included in the most recent VHLSS were collected in 2006, before the Decision was adopted. Instead of analyzing who actually received social allowances, this study thus investigates who in the VHLSS 2006 would have potentially been a beneficiary of Decision 67 had the policy been implemented in 2006. In addition to measuring the program's coverage of the poor, the study also investigates the possible impacts of Decision 67 on these households' poverty status and gives indicators of the program efficiency to drag people out of poverty.

#### The Potential Beneficiaries

This section describes the approach used to estimate the potential coverage of Decision 67. The study calculates the share of the poor in the VHLSS 2006 that would have been recipients of social allowance had Decision 67 been implemented in 2006 without any targeting or funding problems.

Based on the criteria defined in Decision 67, the group of potential beneficiaries in the VHLSS is defined as including:

- All the children who live alone in households with non working-aged or elderly person
- All the elderly aged 85 and above who are not pensioners

- All the households that include at least two severely disabled members
- The poor elderly (above the standard retirement age) who live alone or with other elderly persons.
- The poor household that include one severely disabled member or with long-term sickness
- The poor households that include children and only one working-aged member or non working-aged member

Four criteria of poverty are used to define which households are poor: the GSO poor and extremely poor, the MOLISA poor and the registered poor. The numbers of GSO poor and extremely poor are computed according to the GSO poverty lines. These lines represent the cost of consumption baskets that include food and non-food items or food items only. The food spending is large enough to secure 2100 calories per day per person. A household is poor if its level of consumption per capita is lower than the combined food and non-food poverty line; it is extremely poor if its level of consumption per capita is lower than the food line. Instead of using consumption per capita, the number of MOLISA poor is obtained by comparing household per capita income to the MOLISA official thresholds used to define if an households is poor or not. MOLISA's poverty income threshold in 2006 was equal to VND 200,000 per capita per month in rural areas and VND 260,000 per capita per month in urban areas. These limits are currently under revision and could be increased to VND 300,000 and 390,000, respectively. The study uses, however, the thresholds used in 2006. The reason is that the use of new thresholds would require estimates of each household's change in income in 2007 and 2008. This task is out of the scope of this study. Finally, the number of registered poor in 2006 is obtained directly from the answers reported in the VHLSS.

Table 2 gives the number of poor households or individuals according to each poverty criteria. The number of poor according to GSO methodology is about two times the number of registered poor or poor according to MOLISA criteria on reported income per capita. Based on GSO poverty lines, in 2006, there were about 13 million poor people in Viet Nam of which 5.5 million lived in extreme poverty. However, only about 7 million people live in households that report income per capita lower than the MOLISA poverty thresholds. The number of about 6 million registered poor is therefore consistent with such observation.

Table 2Poverty rates and number of poor and poor households In the VHLSS 2006

	Households		Population				
Indicator of poverty	Number	Percentage	NT 1	Percentage	Survey Confidence Interval <sup>1/</sup>		
	Number	of total	Number	of total	Lower bound	Upper bound	
GSO Poor	2,637,468	13.4	13,047,757	15.8	14.8	16.8	
GSO Extremely poor	1,013,592	5.2	5,448,373	6.6	5.9	7.3	
MOLISA poor	1,388,157	7.1	6,772,450	8.2	7.5	8.9	
Registered poor	1,302,239	6.6	6,106,525	7.4	6.7	8.1	

Source: VHLSS 2006

Table 3 and 4 compare the distribution of the MOLISA poor and registered poor in the GSO poor, extremely poor and non-poor categories. The results indicate that only a very few of the MOLISA poor (1.8 percent see Table 3) and none of the registered poor (see Table 4) appear to be non-poor according to GSO. As already observed in Table 2, the number of GSO poor is about two times the number of the registered poor or MOLISA poor. Thus, as the opposite, 53.2 percent of the GSO poor are unregistered poor and, 57.8 percent of the GSO poor report levels of income per capita higher than the MOLISA poverty thresholds. More surprisingly, 46.1 percent of the GSO extremely poor are unregistered and 37.1 percent reports income higher than the MOLISA poverty thresholds.

## Table 3The distribution of the poor and non-poor According to GSOand MOLISA poverty criteria

MOLISA	Poverty - GSO		Extreme poverty - GSO		
(income)	Non-poor	Poor	Non extremely poor	Poor but non extremely poor	
Non-poor	98.2	57.8	95.7	37.1	
Poor	1.8	42.2	4.3	62.9	
Total	100.0	100.0	100.0	100.0	

Source: VHLSS2006

## Table 4The distribution of the poor and non-poorAccording to GSO and MOLISA poverty criteria

Desistand	Poverty - GSO		Extreme poverty - GSO		
Registered poor	Non-poor	Poor	Non extremely poor Poor but non extreme		
Non-poor	100.0	53.2	95.9	46.1	
Poor	0.0	46.8	4.1	53.9	
Total	100.0	100.0	100.0	100.0	

Source: VHLSS 2006

It is interesting to observe (Table 5) that although the total number of registered poor is close to the total number of MOLISA poor, the two groups do not cover the same people: 47.7 percent of the registered poor report income per capita higher than the MOLISA poverty threshold. This result suggests that procedures used by MOLISA and local authorities to screen poor people include other criteria in addition to the revenue threshold or that local authorities encounter difficulties in measuring the level of households income.

Finally, only 3.4 percent of the MOLISA poor are unregistered. This result suggests that in the procedure of defining who is poor, the detection and coverage of people with little income is rather well done.

## Table 5The distribution of the poor and the non-poor accordingto MOLISA criteria of poverty and reported poverty registration

MOLICA moon	Registered poor				
MOLISA poor	Unregistered	Registered			
Non-poor	96.6	47.7			
Poor	3.4	52.3			
Total	100.0	100.0			

Source: VHLSS2006

#### 4. Potential Coverage of the Poor by Decision 67

Table 6 presents the results regarding the potential coverage of the poor of the VHLSS 2006 had Decision 67 been introduced in that same year without problems of identifying the poor.

Depending on the poverty criteria used, between 30.3 and 35 percent of poor households could have been eligible for social allowances.

### Table 6Potential coverage of the poor by Decision 67

Indicator of poverty	Percentage of poor households potentially eligible	Percentage of poor population potentially eligible		
GSO poor	29.3	25.7		
GSO extremely poor	30.3	25.0		
MOLISA income poor	27.8	24.1		
Registered poor	34.1	29.8		

Source: VHLS 2006

Decision 67 is not totally oriented to the support of poor households, children living on their own, non-pensioner elderly aged 85 and above as well as households with two or more severely disabled members are entitled to social allowances even if they are not classified as poor. As a result, as shown by figures in Table 7, between 36.8 and 68.4 percent of potential households recipients of social allowances under Decision 67 are not poor.

### Table 7Share of non-poor recipients in the total potential beneficiaries of Decision 67

Indicator of poverty	Percentage of non-poor household beneficiaries	Percentage of non-poor beneficiaries
GSO poor	36.8	37.8
MOLISA income poor	68.4	69.8
Registered poor	63.6	66.3

Source: VHLS 2006

Figures presented in Table 6 indicate the levels of coverage of the poor the program could have achieved if there was not any implementation problem. In the practice, finding and screening the poor from the non-poor is a difficult task. Problems of locating the poor will result in lower coverage. Problems of screening will produce some leakage: non-poor who according the regulations are not eligible to social allowances would end up among the beneficiaries.

#### 4. Potential Impacts on Households' Poverty Status of Decision 67

#### Potential Impacts on Households' Poverty Status

This section describes the approach used to estimate the potential impact on the poverty status of the VHLSS 2006 households recipients of social allowances according to the rules stipulated in Decision 67. The study calculates how many recipients could have been "dragged out of poverty" thanks to social allowances. The following methodology is used:

The members of the household h are poor if the consumption per capita of household h is lower than the poverty line l, that is:

(1) if 
$$\frac{C_h}{N_h} < l$$

The provision of social allowance could help the members of this household to satisfy their basic needs if:

(2) if 
$$\frac{C_h + T_h}{N_h} >= l$$

A precise evaluation of possible welfare impacts of social allowances distribution would require taking into account the fact that the increase of household total consumption may be lower than the amount of social allowance received. Households can decide to save a portion of the allowance. Some members can decide to shorten their working hours and thus finance a lower level of consumption than in the absence of the transfer. Friends and relatives can decide to decrease the support (gift, remittances, etc.).

Bearing these caveats in mind, this study measures how much poverty could be reduced if social allowances were totally used to support household consumption.

Table 8 presents the results regarding the potential impact of social allowances distribution on the VHLSS poor households' poverty status had Decision 67 been applied that same year.

Thanks to the receipts of social allowances, between 17.9 percent and 26.2 percent of poor households could cover their basic needs and "escape poverty" if using all of the transfers to buy consumption goods. As a result, the overall population poverty rate could be reduced from 1.0 percentage point to 2.1 percentage points depending on whether the program would have managed to target poor population as the registered poor in 2006 or poor people according to the GSO poverty criteria.

About three quarter of poor households' social allowances would, however, not be enough to cover their poverty gap. The poverty gap is the distance between poor households' level of consumption or income per capita and the poverty line.

Impact on poor households						
Indicator of poverty	Percentage of poor households receiving social allowance dragged out of poverty	Percentage of poor population receiving social allowance dragged out of poverty				
GSO poor <sup>1/</sup>	17.9	13.2				
GSO extremely poor <sup>1/</sup>	24.0	16.6				
MOLISA income poor <sup>2/</sup>	26.2	19.2				
Registered poor <sup>1/</sup>	19.1	13.9				
Impact on poverty rate						
	Initial poverty rate	Poverty rate after receipt				
GSO poor <sup>1/</sup>	15.8	13.7				
GSO extremely poor <sup>1/</sup>	6.6	5.5				
MOLISA income poor <sup>2/</sup>	8.2	6.6				
Registered poor <sup>1/</sup>	7.4	6.4				

Table 8Potential impact on poverty of Decision 67

*Note: 1/ if social allowances are entirely used to buy consumption goods. 2/ social allowances are added to households income per capita and compared to MOLISA poverty thresholds* 

#### 5. Potential Efficiency of the Overall Program

This section describes the approach used to evaluate the program's overall potential efficiency in terms of poverty reduction.

Table 9 first compares the amount of budget that would be distributed to the poor and the non-poor. In 2006, had Decision 67 been fully implemented without problems of targeting, screening and funding, the total budget of social allowances would have ranged between VND 1.9 and 2.8 billion (2006) depending on the poverty criteria used to target poor population. The efficiency of these funds in reducing poverty would have been limited by the fact that the program does not only target poor populations. As figures in Table 9 show, a large budget portion, from 33.8 to 60.7 percent, could be distributed to non-poor.

Table 9	
Distribution of social allowances under Decision 67 <sup>1</sup>	/

	Budget	Budget distributed in a year					
Indicator of poverty	needed to eradicate poverty <sup>2/</sup>	Total in VND billion	% of the poor moving out of poverty	% of the remaining poor	% of the non-poor		
GSO poor	2,028	2,828	40.6	25.6	33.8		
GSO extremely poor	526	1,878	30.6	8.7	60.7		
MOLISA income poor	77	2,262	38.4	13.2	48.4		
Registered poor	1,234	2,199	28.9	21.1	50.0		

Source: VHLSS 2006 Note: 1/ Difference between the initial and after receipts poverty rates reported in Table 8 2/ Sum of the poverty gaps of the poor households recipients of social allowance

A second source of inefficiency is that the amount of social allowance in Decision 67 is determined by category but not in relation to the recipients' poverty gap. There are risks, consequently, that the amount of social allowance is too small to help the family escape poverty or too high regarding its uncovered basic needs. In the later case, part of the funds could have been used to help other poor households.

Regarding the budget distributed to the poor, Table 10 shows that 39 percent of poor households (GSO criteria) and 43.9 percent of registered poor households would receive an allowance too small in relation to the poverty gap they cannot manage to cover. At the opposite, 31.8 percent of poor households (GSO criteria) and 27.3 percent of registered poor would receive allowances two times higher than their poverty gap.

This situation is due to the fact that the amount of allowance is determined independently of the situation of the recipients. An extremely poor household with two severely disabled persons receive the exact same amount of social allowance than a poorer or better off household also with two severely disabled members.

Table 10Distribution of poor householdsdepending on the share of the poverty gap covered by social allowances

	GSO poor households			Registered poor households		
	Number	Percentage of total	Cumulative distribution	Number	Percentage of total	Cumulative distribution
Below 25%	23,855	3.1	3.1	12,011	2.7	2.7
25% to less than 50%	98,551	12.8	15.9	62,164	14.0	16.7
50% to less than 75%	81,997	10.6	26.5	48,730	11.0	27.7
75% to less than 100%	96,697	12.5	39.0	71,985	16.2	43.9
100% to less than 125%	55,023	7.1	46.1	34,892	7.9	51.8
125% to less than 150%	80,161	10.4	56.5	43,658	9.8	61.6
150% to less than 175%	58,667	7.6	64.1	33,085	7.5	69.0
175% to less than 200%	31,719	4.1	68.2	16,200	3.7	72.7
200% and above	245,545	31.8	100.0	121,241	27.3	100.0
Total	772,216	100.0		443,968	100.0	

#### **6. Social Allowance Policies towards the Extremely Poor**

The previous sections show that had Decision 67 been implemented in 2006 without any targeting and financing problems, social allowance would have had covered only a small portion of the poor and would have had rather little impact on poverty in that same year. Even if the goal was to reduce extreme poverty, 4.2 million of the registered poor, and an additional 1.9 million of the extremely poor according to GSO criteria (but not registered as poor) would not have fit into any category as defined in Decision 67 and, consequently, would have been excluded from the receipts of social allowance.

This section, accordingly, investigates which changes or new policies could be implemented in Viet Nam so that social allowances policies could play a significant role in the country's strategy to eliminate extreme poverty. In such analysis, the targeted groups are the registered poor and the GSO extremely poor (who are unregistered) who are excluded from social allowances under Decision 67. The aggregation of these two groups makes sense because the process for poor registration appears to be very efficient at avoiding errors of inclusion. According to the results of Table 4 above, only 4.1% of the registered poor are not included in the group of GSO extremely poor. The latter enclose the group of registered poor.

Table 12Extremely poor excluded from social allowances under the Decision 67

Indicator of poverty	Number of poor households	Number of poor people
Registered poor	858,271	4,288,712
GSO extremely poor unregistered	318,257	1,964,413

Improving social allowance to reduce extreme poverty will, therefore, benefit the overall population in Viet Nam. Expanding the coverage of social assistance allowances is not particularly related to problems of screening the extremely poor among ethnic minorities groups. As figures in Table 13 show, households currently excluded from social allowances are Kinh and Chinese rather than ethnic minorities: 66.8 percent and 78.2 percent of the Kinh and Chinese and ethnic minorities extremely poor are excluded, respectively. The remark remains valid within each of the registered group and the registered GSO extremely poor. The extremely poor from ethnic minorities represent 54.1 percent of those excluded.

Table 13Extremely poor excluded from social allowances under the Decision 67by ethnic groups

	Number of people			Excluded	Total distribution	
	Excluded	Potentially eligible	Total	share in category	Excluded	Eligible
Total registered poor						
Kinh and Chinese	2,110,991	1,149,416	3,260,407	64.7	33.8	48.6
Other ethnic groups	2,177,721	668,397	2,846,118	76.5	34.8	28.3
GSO extremely poor u	inregistered					
Kinh and Chinese	758,001	275,096	1,033,097	73.4	12.1	11.6
Other ethnic groups	1,206,412	272,698	1,479,110	81.6	19.3	11.5
Total registered poor	and GSO extre	emely poor				
Kinh and Chinese	2, 868,991	1,424,513	4,293,504	66.8	45.9	60.2
Other ethnic groups	3,384,134	941,094	4,325,228	78.2	54.1	39.8
Total	6,253,125	2,365,607	8,618,732	72.6	100.0	100.0

#### Demographic Composition

Most of the eligibility criteria in Decision 67 are related to the household structure and presence of non-working members. Households with severely disabled members are effectively more likely to be poorer than the rest of the households. More generally, individual income of the able-bodied persons in poor households with a large dependency ratio (including elderly or raising children alone) are mostly not sufficient to help cover all the basic needs. The groups defined in Decision 67 do not, however, include families with high dependency ratio because they include many children or not-old-enough people (aged between 65 and 85).

Resistance to provide social allowances to families with many children is often related to concerns that social assistance may reduce the direct costs of raising children and thus encouraging higher fertility as a result (WB report, p. 39). In Viet Nam such effect would work against the government's policies that try to slow down the country's demographic growth.

Not supporting extremely poor children has, however, lasting negative consequences. Children living in extremely poor families are more likely to be working, and among poor children, those working are much less likely to go to school (see Table 14).

Children who drop out early from school face a lifetime of lower earning (WB report p. 15). The PPA has collected evidence of these negative consequences. In the province of An Giang, local officials not only observe that "many poor households have to stop their children's education" but signal the negative long-term impacts on children's physical and mental development as busy poor parent provide less care to their children (PPA p.26). These children are more likely to continue to be poor for the rest of their life. As a result, the likelihood of poverty initially related to an unfavorable dependency ratio in the family is passed on to the next generations who remain chronically poor even if they no longer live in households with particularly unfavorable dependency ratio. There are no easy solutions to solve the social problems related to child labor. Providing social allowances to all extremely poor families regardless of their demographic structure is, however, likely to be part of the solution.

To avoid social allowances to promote fertility, a number of programs have been put in place, such as the Bolsa Familia in Brazil which cap the social assistance benefits set according to the number of children in the family to three (WB p. 134). In Viet Nam such cap could be viewed as discriminatory against the ethnic minorities who currently have very large families. As the WB report suggests, the implementation of programs requiring women to get minimal preventive health care and education and promoting information activities on birth spacing health benefits might also help to reduce the unwanted impact of social allowances on fertility.

	Average	Confidence Interval	
Excluded with high dependency ratio over 0.5	6.2	5.5	7.0
Excluded with low dependency ratio equal or under 0.5	7.8	6.2	9.4
Total	6.7	5.9	7.4

Table 14Rate of working children (age 6 to 14 years old)

#### Working Poor

Poverty is not only observed in households with high dependency ratio. Table 15 shows that among the extremely poor households excluded from social allowances under Decision 67, 48.1 percent have a dependency ratio equal or lower than 0.5. In these households, there is one or more working age adult per dependent. In fact, 65.1 percent of the extremely poor households excluded from social allowance include two children or fewer.

Table 15
Number of children in poor families not eligible to social allowances under Decision 67
<b>Registered poor and GSO extremely poor</b>

	Number of households	Distribution	Share of households with two or fewer children
Potential beneficiaries	552,800	32.0	78.8
Excluded with high dependency ratio over 0.5	344,599	19.9	13.6
Excluded with low dependency ratio equal or under 0.5	831,929	48.1	86.5
Total	1,729,327	100.0	69.5
Excluded with two or fewer children	766,372		65.1

This is also true among households of ethnic minorities. Figures in Table 16 show that more than half of the poor ethnic minority households who are currently excluded from social allowances are families with two or fewer children. As expected, this share is higher in the Kinh and Chinese group (71.1 percent).

These figures also show that for most of the poor households excluded from social allowances, causes of poverty are not directly related to a particularly high dependency ratio: 70.5 percent of the poor ethnic minority households have a low dependency ratio, a very similar share to the one observed in the Kinh and Chinese group.

#### Table 16 Number of children in poor families not eligible to social allowances under Decision 67 Registered poor and GSO extremely poor

	Share in total	Share with 2 or fewer children	Share in total	Share with 2 or fewer children
	Ethnic minorities		Kinh and Chinese	
Excluded with high dependency ratio over 0.5	29.5	9.6	29.1	17.9
Excluded with low dependency ratio equal or under 0.5	70.5	80.3	70.9	92.9
Total	100.0	59.4	100.0	71.1

Based on the observations collected in the PPA, Table 16 to 18 present some other factors related to extreme poverty that might be important to take into account in the design of social policies aimed at eliminating extreme poverty. More exhaustive analysis can be found in the chapter of poverty assessment investigating on the poverty profiles.

Table 17 shows that extremely poor households with low dependency ratio (the large majority of the extremely poor households currently not covered by social allowances according to Table 16) are in fact households with low income earners. Each able-bodied working-age member earns on average VND 4,047 million. Working-age members of other poor groups (the extremely poor with high dependency ratio, and the other GSO poor) earn significantly higher levels.

#### Table 17 Average labor income per able working age households members thousand VND per year

	Average	Survey 95% Confidence interval	
Potential beneficiaries	5,186	4,843	5,530
Excluded with high dependency ratio over 0.5	5,735	5,352	6,117
Excluded with low dependency ratio equal or under 0.5	4,037	3,813	4,261
Other GSO poor	5,979	5,674	6,283

Table 18 indicates that this situation is not strongly related to the fact that the extremely poor families could not benefit from the recent economic growth. Only about one quarter of the households with high and low dependency ratio (currently excluded from social allowances) reports that living conditions have not improved since 2001.

## Table 18Share of households which living conditions have not improved since 2001Percentage in the category

	Average	Survey 95% Confidence interval	
Potential beneficiaries	41.9	35.7	48.2
Excluded with high dependency ratio over 0.5	23.8	16.6	31.1
Excluded with low dependency ratio equal or under 0.5	25.2	20.8	29.6
Other GSO poor	14.5	11.0	18.0

Table 19 shows that these households, however, have been borrowing in the past year. The share is 40.8 and 33.7 percent in case of the extremely poor excluded from current social allowances.

	Average	Survey 95% Confidence interval	
Potential beneficiaries	26.7	21.0	32.3
Excluded with high dependency ratio over 0.5	40.8	33.1	48.6
Excluded with low dependency ratio equal or under 0.5	33.7	32.5	42.9
Other GSO poor	33.1	28.5	37.7

Table 19Share of households with borrowing Percentage in the category

Low income can be associated with particularly low returns but also income shocks. Most poor people have low education and few assets. It is not surprising that they obtain, consequently, low returns from their work. However, the fact that households with relatively small families reporting particularly low income suggests that a non-negligible share of these families have suffered some income shocks in the past. The data does not lead to strong conclusions but the high share of borrowing households also points out to the same interpretation. As the PPA observes, many poor and near poor households receive loans from private lenders serving their production. Natural disaster and epidemics are the most serious risks faced by the poor. Harvest or livestock losses leave the poor during several years with large amounts of outstanding debt to private lenders and the Social Policy Bank. As a result, poor households accumulate private debts with accumulated interest seasons after seasons which make them increasingly poorer (PPA 2008). A similar situation was described after the massive flood in Bangladesh in 1998. No major food crisis occurred. "The flood did exact a heavy cost in terms of increased private debt because of extensive borrowing in private markets, a major coping strategy of the poor. Even after avoiding the worst outcomes, more subtle issues may arise, such as the increasing debts from which households may take a long time to recover" (World Bank 2003).

Resistance to provide social allowances to extremely poor households with low income earner and/or have suffered income shocks and are consequently largely indebted is often related to concerns that social assistance may reduce these households work efforts.

Another way to express these concerns is that social allowance risk to create "a culture of dependency and expectancy". These concerns are explicitly reported by the PPA participants. Officials complain that State supports tend to discourage ethnic minorities poor people to be active in their livelihood or to cope with natural and social changes and as a result, they fail to generate the willingness to escape poverty. The project beneficiaries are said to maintain their attitude of reliance and not wanting to work (PPA).

The evidence supports the view that, in developing countries, safety net programs do not often substantially reduce work efforts. Academic studies show virtually no effects on the household's primary earner and a limited effect on the work efforts of secondary earners in low income households. In Mexico, adult earners benefiting from the conditional cash transfer PROGRESA worked as much as those in a randomized control group. In Brazil, simulations of the impact of the program Bolsa Familia on adult work efforts found that the transfer amounts would have a very limited impact. In Armenia, the employment rate and working hours of adults in the Family Poverty Benefits Program were similar to those of a matched sample of non participants. On the other hand, in Sri Lanka, a rice subsidy program seems to have induced labor disincentives (World Bank 2003). Concerns that social allowances would reduce beneficiaries' work efforts should not, therefore, stop the government from implementing new social policies toward the extremely poor. Concerns about the emergence of a culture of dependency should not be, however, discarded and have to be taken into account in the design of new policies.

#### 7. An Example of Family Poverty Benefits

There is not a single policy designed to support the extremely poor. There are a number of different reasons why families are extremely poor and they vary according to the country and period. The design must, moreover, take into account how much concerns about the impact of new policies on the importance of fertility and work efforts to the country.

Consequently, general advises on how to proceed can only remain rather vague. Extensive advises on all sort of settings are presented in the WB report. However, to help the reader to get a precise idea of the type of policy that can be developed, this note has opted to present one example: the Armenian Family Poverty Benefit program. Armenia is a transition country that moved in 1999 from a social allowances system based on categorical groups as the one currently being implemented in Viet Nam to a more inclusive approach. Armenia's targeting performance is also viewed as excellent by international standards: it is as good as or better than the targeting achieved by the much-praised conditional cash transfers in Latin America (SP paper) because through that process, all documentation was made public. The example of Armenia gives a good opportunity to understand how new social policies can be developed and implemented to reduce extreme poverty.

The following extracts are taken from the annex of the World Bank poverty assessment of Armenia (World Bank 2003).

The major component of reform in Armenia was the consolidation of 26 small, uncoordinated categorical benefits in cash paid to individuals into a single monthly cash benefit targeted to the most needy families (the Family Benefit). Various targeting options were considered, including using a regression calculated from the 1996 Household Budget Survey. However, consumption correlates were not sufficiently strong and the Government decided to target the new Family Benefit using a somewhat adjusted proxy means-testing targeting mechanism developed for humanitarian assistance distribution. The new system was introduced in 1999 with the new regulations approved in 2000.

The Regional Social Service Centers were given the responsibility of implementing the policy. In order to create local dialogues about the way policy was implemented, local Social Assistance Boards were also put in place with representatives (on a voluntary basis) of social and employment services, heads of social insurance centers, local administrators, local officers dealing with adolescent problems as well as NGOs representatives.

Families who regard themselves as poor or extremely poor and seek State assistance first submit their applications and all required documents to the Regional Social Service Center. Inspectors then process the application and eventually visit the family in order to check the accuracy of the information. This set of information constitutes the family Social Passport on which the Center calculates a ranking score. Families that score within the eligible ranges can benefit from the State support for twelve months. In order to continue receiving the benefit, the household has to apply for the benefit again and go through the same eligibility testing procedure.

The benefit administration is computerized, and the centralized database is managed by the Ministry of Social Security. The database is linked to other databases relevant for crosschecking of the economic and social situation of the applicant families (electricity consumption, telephone bills, customs records, the list of pensioners, etc.). The benefits are delivered to the beneficiaries through the post offices.

The family score is obtained with the use of a proxy means testing formulas that includes the following variables:

- social category of each of the family members, or individual "social risk" ( $P_k$ ) and related average "social risk" for the family ( $P_m$ );
- number of family members not capable of working (P<sub>c</sub>);
- place of residence (P<sub>r</sub>);
- housing situation  $(P_{h})$ ;
- car ownership  $(P_a)$ ;
- private business  $(P_{\rm b})$ ;
- the document issued by respective territorial center for social services verifying the social and economic situation of the applicant family (P<sub>f</sub>) and its eligibility for the benefit ("eligible" and "not eligible");
- family income (Pi).

The particularity of the Armenian system is that whereas in other countries regression analysis or similar statistical techniques are used to determine the PMT scores (see example in Box 1), Armenia's weights and point system was determined based on expert opinion of what would be the likely predictors of poverty<sup>1</sup>.

The score of the family need (P) is calculated using the following formula:

 $\mathbf{P} = \mathbf{P}_{\mathrm{m}}^{*} \mathbf{P}_{\mathrm{c}}^{*} \mathbf{P}_{\mathrm{r}}^{*} \mathbf{P}_{\mathrm{h}}^{*} \mathbf{P}_{\mathrm{a}}^{*} \mathbf{P}_{\mathrm{b}}^{*} \mathbf{P}_{\mathrm{f}}^{*} \mathbf{P}_{\mathrm{f}}^{*}$ 

where (a) Socio-economic category of each of the family members (individual social risk)— $P_k$  and related average "social risk" for the family ( $P_m$ ).

Each family member is screened for a certain social category, e.g. for whether she/he belongs to a certain category of "social risk". Each category brings a certain number of points. The number reflects the assumed level of need of each category. The list of categories and

<sup>-</sup>

<sup>1.</sup> This aspect was apparently driven by the fact that households with informal income can underreport income to become eligible

corresponding number of points is presented in the following table. These categories are similar to those considered in Viet Nam under Decision 67.

	Social category	Points
1	Biological orphan (no parents)	50
2	First category disabled	48
3	Child invalid (up to 16)	45
4	Biological orphan (one parent deceased)	43
5	Second category disabled	39
6	Pensioner (75+)	39
7	Single pensioner	36
8	Child below 2 year of age	35
9	Pensioner	34
10	Child 2-18	33
11	Pregnant women (20+ weeks)	30
12	Third category disabled (below pension age)	28
13	Unemployed	27
14	Single mother child	26
15	Child of divorced parents	26
16	Public university student	22
17	No social category 20	20

In cases where one person belongs to several social categories, a weighted average is calculated. The weights are as follows: for the category with the highest number of points 1.0; for the second highest 0.3 and for the third and all the rest 0.1. For instance, a person can be a 17-year old child (category 10), with divorced parents (category 15), a student (category 16) and a third category disabled (category 12). His/her individual social category (or "social risk") score is calculated in the following way:

$$P_{k(ind)} = P_{10} + 0.3*P_{12} + 0.1*(P_{15}+P_{16}) = 33+0.3*28+0.1(26+22) = 46.2$$

The average "social risk" score for a family is calculated as the arithmetic mean of the family members' scores.

(b) Number of family members not capable of working ( $P_c$ ). The value of this factor is calculated as follow:  $P_c = 1.0 + 0.02^*$ m, where *m* is the number of family members incapable of working, namely children up to 16, women over 63, men over 65 and first and second category disabled.

(c) *Place of residence*  $(P_r)$ . For most of the settlements in Armenia, the value of this factor is one. However, there is a list of 173 settlements (in the earthquake zone and border territories) for which the coefficient ranges between 1.03 and 1.05.

(d) *Housing situation* ( $P_h$ ). Housing situation is classified into 6 categories with the following coefficients: "domik" (temporary shelter such as a carriage, a barrack, etc., in particular in the earthquake zone) – 1.2; homeless – 1.07; unsafe dwelling – 1.05; collective center – 1.03; other – 1.02; permanent dwelling – 1.

(e) *Filter variables (0 or 1).* The following factors are used as filters: a car ownership ( $P_a$ ), private business ( $P_b$ ), and a document issued by respective territorial center for social services verifying the social and economic situation of the applicant family and its eligibility for the benefit ( $P_f$ ). Their value can be either 1 or 0. Obviously, 0 for any of the three (the family has a car and uses it, the family or its members are running private business and the social services center has assessed the family as ineligible for the benefit) eliminates the family from the list of beneficiaries.

(f) Family income. The family income coefficient is calculated using the following formula:

$$P_{i} = 1.2 - 0.04^{*}(SS_{i}/m^{*}M)$$
 (j=1...n)

where *n* is the number of household members,  $s_j$  is the income of the *j*-th household member, *m* is the number of present household members, and *M* is the minimum wage (regulated by the Government). The income includes wages and salaries, income from self-employment, pensions, stipends and unemployment compensation. Income from farming is estimated based on cadastral income, while income from cattle breeding is estimated separately using a methodology regulated by the Government.

The score that qualifies the household for the benefit is 36.01. It has remained unchanged since the family benefit was introduced.

As it was already mentioned above, the Armenia's targeting performance is considered excellent by international standards. An advantage of the ranking score is that the system can differentiate the amount of aids according to it. For example in Georgia, families with very low score that are considered extremely poor and receive monetary aid for subsistence while others receive subsidized access to health insurance and electricity (World Bank 2003).

Evaluation reports mention, however, that the policy does not reach all the poor families because many of them do not apply. The reasons are not clear: perhaps they do not understand well the process, or the process seems too complicated or perhaps they do not want to ask for the State support (World Bank 2003).

Currently, the screening process in Viet Nam is very efficient: only a few of the registered poor are not extremely poor. However, many extremely poor are excluded from registration. Some studies suggest that the main reason is that the lack of social policy funding leads local authorities to reduce the list of the potential beneficiaries. It could also be that the current screening method has some limitations. Based on interviews conducted in three provinces at the provincial, district and communal level, a GTZ mission (2008) signals that "potential beneficiaries (even those registered) display a general lack of information... concerning [the] services and benefits delivered by social assistance... together with a low awareness of

actually having a (claimable) right to receive social assistance and proper services". Eliminating extreme poverty requires, therefore, besides the systematic collection of information, the implementation of more resolute actions to reach and include all the extremely poor (public campaigns, systematic visits of social workers in potentially extremely poor households etc.).

	Coef	S d		Coef	S d
lh h size	- 0.562 ***	0.036	Cooking Oven	0.054 ***	0.020
lh h size 2	- 0.014	0.011	Cooking Stove	- 0.001	0.019
Share of children 0 - 6	- 0.534 ***	0.037	Microwave Oven	0.067 ***	0.013
Share of children 7 - 14	- 0.520 ***	0.035	Dish washer	- 0.007	0.035
Share of children 15 - 18	- 0.121 ***	0.046	Vacuum Cleaner	0.060 ***	0.009
Share of adult males (19 - 60)	(dropped)		TV Set	0.112 ***	0.029
Share of adult males (19 - 60)	- 0.166 ***	0.035	Satellite Receiver	0.042 ***	0.010
Share of elderly	- 0.144 ***	0.038	Video	0.045 ***	0.012
Share of job holders	- 0.010	0.030	Video Camera	0.067 ***	0.020
Share of employed in public sectror	0.038 ***	0.012	Computer	0.063 ***	0.010
Recieves any subsidy	- 0.106 ***	0.017	Telephone	0.075 ***	0.009
Charac teristics of the head			Mobile Phone	0.128 ***	0.011
Female headed hh	0.037 **	0.015	Air Conditioner	0.099 ***	0.018
Age of the head	0.001 *	0.001	Solar Heater	0.008	0.012
Education of the head			Private Car	0.210 ***	0.009
Illite rate	(dropped)		Radio	0.005	0.008
Read/Write	0.048 ***	0.017	Sewing Machine	0.004	0.011
Primary	0.056 ***	0.016	Characte ristics of dwelling		
Elementary	0.043 ***	0.016	Number of rooms	0.050 ***	0.005
Basic	0.021	0.024	Villa	(dropped)	
Secondary	0.083 ***	0.018	House	0.008	0.041
In termidiate	0.088 ***	0.020	Flat	0.029	0.041
University	0.156 ***	0.021	Dwell in gaream 2	0.001 ***	0.000
Occupation of the head			Type of ownership		

**Box 1** The following table gives an example of the weights derived from poverty regression used in means testing procedures. (A. Posarac, The system of Social Assistance based on proxy means testing, presentation in Sarajevo)

hocc_1	- 0.031	0.059	Own	0.040 ***	0.015
hocc _ 2	0.101 *	0.059	Rented	0.018	0.016
hocc_3	0.007	0.057	For work	- 0.096 *	0.049
hocc_4	0.026	0.058	Free	(dropped)	
hocc_5	- 0.013	0.058	Sourceofheati ng		
hocc_6	0.038	0.056	Kerosine	0.056	0.054
hocc_7	(dropped)		Gas	0.102 *	0.055
hocc_8	- 0.005	0.056	Central	0.249 ***	0.057
hocc 9	0.006	0.056	Electricity	0.169 **	0.070
hocc _ 10	- 0.033	0.055	Wood or coal	0.039	0.058
hind _ 1	0.033	0.040	Other	(dropped )	
hind _ 2	- 0.010	0.060	Noheating	0.005	0.065
hind_3	0.033	0.058	Sourceof drinking water		
hind_4	0.068	0.067	Piped water	- 0.237 ***	0.068
hind_5	0.024	0.058	Well	- 0.217 ***	0.070
hind_6	- 0.010	0.056	Water tank	- 0.180 **	0.071
hind _ 7	0.051	0.057	Mineral / filtered water	- 0.185 ***	0.069
hind_8	0.027	0.057	S p r in g water	(dropped)	
hind _ 9	- 0.011	0.057	P u b l ic s e w a g e	0.017	0.011
hind _ 10	- 0.000	0.060	Construction material		
House hold assets			Clean Stone	0.209 ***	0.065
WASHING MACHINE	0.095 ***	0.024	Stone & concr	0.136 **	0.064
REFRIGERATOR	0.070 ***	0.024	Concreate	0.113 *	0.064
FREEZER	0.044 ***	0.014	Cement block	0.096	0.063
#### 8. Conclusion

This study investigated the possible impact of the new social allowance policy designed in Decision 67 of 2007. Because there still are not any statistics collected about its implementation, the study uses the data collected in the VHLSS 2006 to measure how many people and families could benefit from such policy if its implementation did not encounter problems of screening or funding. It shows that a large share of the extremely poor would remain excluded.

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#### Annex. Households with people with severe disability<sup>1</sup>

Disabled people face many difficulties and deprivations that are far beyond economic problems and, the economic difficulties they face are multidimensional. Studying the situation of the disabled person and design policies to support them are very complex tasks. This note only investigates one aspect: the household's welfare.

Several reasons justify that having a disabled person at home can reduce the household's welfare. First, some disabled persons have lower productivity than non-disabled people, thus earning lower income. Some cannot work at all. Second, some disabled persons need special care and spending. This reduces other household members' consumption level and limits their dedication to work, study and other direct or indirect income opportunities. All disabled people do not have such negative impact on the households they live in. More likely, people with severe disability do. In order to alleviate this impact, Decision 67 target poor people with severe disability who live in poor households.

This note looks at this issue and shows that among households severely disabled, those including children are much more likely to be poor than the others. Households that include a working age person with severe disability are also more likely to be poor. These results suggest that particular efforts should be developed during the implementation of Decision 67 to effectively cover these households and design specific interventions to support better these populations.

<sup>1.</sup> This annex was written by authors with the participation of Tran Ngo Minh Tam.

#### A. Data and definitions

The analysis is based on the results of the VHLSS of 2006. The section 3B reports people self-rating (slightly difficult or very difficult) upon six types of disability: seeing, hearing, concentrating & understanding, taking care of themselves, mobility, communicating with others. The study focus only on people with severe disability which are those who have answered <u>at least</u> one of these tasks was very difficult. According to these criteria, 1,219 respondents of the VHLSS 2006 had severe disability.

The small number of samples makes it difficult for sub-groups analysis, therefore, the study, accordingly, searched to regroup the 6 types of disability into 3 groups:

Group 3: includes all persons reporting that it is very difficult to understand something new or what someone else is talking about or to start and keep a conversation going

Group 2: includes all persons reporting that it is very difficult not using tools to walk some 400 meters long or to climb 10 steps non-stop or, those reporting that they need someone to help in their everyday life.

Group 1: includes other severely disabled for whom it is very difficult to see and listen with glasses and hearing aid, or, to bow, bend or to stand on their knees or, to raise their hands over head or to use fingers to button or, to put on socks or, to tie the shoe laces or, to comb hair, or to eat without any aid.

Group 0: includes all persons who are not severely disabled and included in the groups above

The groups were built based on the types of disability and poverty rate among the disabled of each specific type when compared to the poverty rate of the non-disabled population. Because the poverty rate is highest among the group 3 of people with disabilities, all people with such disability and other disabilities were included in the group 3. Similarly, because the poverty rate of people with the disabilities of group 2 are also very high in comparison to people with other types of disability, all persons with such types of disability and other types were included in the group 2.

The survey also reports the reasons that caused current disability. There are 12 possible causes and several other reasons that can be reported for one kind of disability. The study selected only the first cause reported by interviewee. The causes are organized into 4 groups:

War and birth: when disability is a consequence of birth defect, war, agent orange or low education level (any person with no birth defect is able to realize the proposed tasks without any education)

Accident: when disability is a consequence of traffic accident, work injury or natural disaster

Illness: when disability is a consequence of illness or related to social evil, old-age (because most of the disabled are reported to developing illness), problems related to other disability, and other.

The cause is reported if the person is severely disabled and the cause is the first cause reported for each type of disability. This means that one person can be associated to several causes because of the several disabilities (even at small disabilities are included because the question is presented regardless of the level of difficulty). In fact only this happens in the case of 2 observations; 41 persons do not report the cause.

The survey, finally, reports the period length the person has been having the disability.

## **B. Frequency and general characteristics**

According to the results of the VHLSS 2006 (and this methodology), there are currently about 2.6 million people severely disabled in Viet Nam, that is 3.1 percent of the population. As figures in Table 1 show, most of them (77.8 percent) are disabled as result of illness or old-age; 17.4 percent are disabled as a consequence of war and/or birth defects. Finally 4.8 percent of persons with severe disability report that the cause was accidental.

Frequency Reason reported for the disability War or Percentage Number of of total birth Accident Illness Total people population defects Other population 79,885,013 96.9 \_ Severely disabled 2,595,840 3.1 17.44.8 77.8 100.0 Mentally ill 870,330 1.1 28.2 2.9 68.9 100.0 Walking and taking care 1,261,638 1.5 11.4 4.6 84.0 100.0 Others 0.6 14.08.8 77.2 100.0 463,872 Total 82,480,853 100.0

Appendix Table 1 People with severe disability: Frequency and Reasons by type of disability

Source: VHLSS 2006

People with serious problems affecting their concentration, understanding and communication others represent 1.1 percent of the total population. Causes to these problems are more likely related to the war or birth defects than in the other cases. People with serious mobility problems or those who cannot take care of themselves represent 1.5% of the population.

Table 2 shows the same results by age groups. Because health deteriorates with age, the incidence of severe disability among the elderly is very high (15.4 percent). About 1.2 percent of the children and 1.5 percent of working aged people are severely disabled.

#### Appendix Table 2 People with severe disability: Frequency and Reasons by age group

		Frequency	Reason reported for the disability			
	Number of people	Percentage of corresponding population	War or birth defects	Accident	Illness	Total
Children	242 738	1.2	25.7	0.8	73.6	100.0
Working age	795 704	1.5	37.6	12.3	50.2	100.0
Elderly	1 557 398	15.4	5.7	1.6	92.7	100.0
Total	2 595 840	3.1	17.4	4.8	77.8	100.0

Source: VHLSS 2006

Causes related to accidents are more important among the working age than in other groups. There is a rather large share of children disabled due to illness.

The graphs in Appendix Figure 1 compare the frequency of severe disability among men and women by age groups. The shapes of the curbs are similar for both sexes. Before the age of 50, the incidence of disability slowly increases with age then accelerates, particularly after the age of 70. Among the elderly aged 70 and above, the frequency of disability appears to be higher among women than men. Because women have longer longevity, this result probably reflects that in contrary to men, women at advanced ages are more likely to survive health shocks than men. Some of them, however, remain severely disabled.

### **Appendix Figure 1**



Finally, about 73 percent of the population in Viet Nam lives in rural areas. It is therefore not surprising that most of the severely disabled live in such areas. However, the incidence of severe disability among working aged people is more important in rural areas: 1.6 percent of the working aged populations in rural areas are severely disabled against 1.2 percent in urban areas (the difference is statistically significant). One reason could be that people working in agriculture are particularly more exposed to work injury or disease than other people. Another reason could be that disabled people are less likely to migrate to urban areas.

#### **C.** Poverty rates

About 12 percent of the Vietnamese households include one or several persons with severe disability. These households are statistically more likely to be poor than the rest of the population. As the figures reported in Table 4 show, 20.8 percent of the people living in household with one or several severely disabled persons are poor while the rate is 15.1 percent among the rest of the population. The measure of poverty is based on a GSO evaluation of household expenditure per capita and estimate of the poverty line.

Type of household	Number of household	Percentage of total households	Poverty rate	Survey Confidence Interval <sup>1/</sup>		
				Lower bound	Upper bound	
Do not include severely disabled	17,324,857	88.3	15.1	14.1	16.2	
Include severely disabled persons	2,305,016	11.7	20.8	17.8	23.8	
Total population	19,629,872	100.0	15.8	14.8	16.8	
With severely disabled children	232,836	1.2	35.3	25.3	45.2	
With severely disabled working aged persons	821,378	4.2	23.4	18.1	28.6	
With severely disabled elderly	1,340,384	6.8	16.6	13.1	20.2	

# Table 4Severe disability: poverty rates

Note: 1/ poverty rates are statistically different if the corresponding survey's confidence intervals do not overlap. Source: VHLSS 2006.

There are about one million households that include children or working-aged severely disabled persons. These households are significantly more likely to be poorer than the rest of the population. The poverty rate of the households that include severely disabled children is particularly higher: 35.3 percent. By contrast, households that include severely disabled elderly are not particularly poor.

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# POVERTY, VULNERABILITY AND SOCIAL PROTECTION IN VIETNAM: SELECTED ISSUES

Chịu trách nhiệm xuất bản TRẦN ĐOÀN LÂM

Biên tập:Quang MinhSửa bản in:Lan AnhBìa:Anh TuấnTrình bày:Phạm Trần Hiếu