WELFARE IN VIETNAM DURING THE 1990s

Poverty, inequality and poverty dynamics

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Abstract Vietnam's economy was transformed during the 1990s through a series of economic, social and political reforms, resulting in an average growth rate over the decade in excess of 6 per cent per annum, accompanied by a dramatic fall in the incidence of consumption per capita poverty. This paper examines changes in poverty and poverty dynamics over the 1990s using a nationally representative panel of households surveyed in 1992–93 and 1997–98. We analyse how robust the reduction in poverty is to the methods used to measure poverty. We find that regardless of where the poverty line is drawn, consumption per capita poverty fell between the surveys. We also examine changes in the distribution of living standards over time, finding that the fall in poverty was accompanied by a rise in inequality, with some sub-groups of the population failing to share equally in the growth of the country. Finally, we examine rural poverty dynamics, presenting transition matrices of movements in and out of poverty over time and estimating a model of consumption growth. We find that regional differences are important, as are access to key institutions and infrastructure, and education. We also find that shifts in employment and production patterns, especially of rice, which we argue to be induced by the economic reform process, are strongly related to changes in living standards.

Keywords Poverty, growth, dominance, economic reform, Vietnam.

JEL classifications C23, I32, O53.

1. INTRODUCTION

Vietnam is one of the success stories in the attack on poverty. During the 1990s, income poverty estimates and a range of human development indicators improved dramatically (World Bank 1999). These achievements have been accompanied by remarkable developments in the economic sphere. The strong economic and poverty progress is largely ascribed to the *doi moi* 'renovation' policies introduced in the late 1980s with removal of price controls on many goods, decollectivization of land, reduction or removal of trade barriers and an opening-up to foreign direct investment.[1] Vietnam's economic and social achievements are particularly

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remarkable given the collapse of the former Soviet Union, on which Vietnam had been dependent for a wide range of manufactured goods. Growth rates averaged 6–7 per cent per year during the period 1990 to 1997, rice production (the main staple crop) increased dramatically, turning the country from a net rice importer to one of the world's largest exporters of rice, and the agricultural sector diversified into production of other goods such as coffee and aquaculture.[2] Increased employment in the private sector led to an employment growth rate between 2 and 3 per cent during the 1990s and furthermore, although data are scarce, evidence suggests that real wages started to rise after 1995 (Economist Intelligence Unit, various issues; O'Connor 1996; World Bank 1999; CIEM 2000; IMF 2000; Minot and Goletti 2000). Table 1 shows some selected economic indicators that illustrate the extent of the transformation.

It would not be surprising, given the economic performance of Vietnam, to see that poverty has fallen in an equally dramatic fashion. World Bank estimates suggest that the incidence of consumption poverty in Vietnam fell from 58 per cent in 1992/93 to 37 per cent in 1997/98 (World Bank 1999) and that a range of human development indicators also improved during the period. Table 2 illustrates the extent of the improvement in a range of welfare indicators.

However, measuring poverty involves a number of steps with a range of technical decisions to be made and it is not always the case that changes in poverty are robust to the decisions taken by the poverty measurer. This paper aims firstly to examine how robust the fall in poverty in Vietnam reported by official sources is to one of the most arbitrary of poverty measurement decisions, namely the choice of poverty line. This is not merely a statistical exercise in appropriate methods of measuring poverty, although this does have some merit, but has an important role

Table 1 Selected economic indicators for Vietnam

	GDP (1998 US$ millions)	*GDP growth (%)*	*GDP p.c. (1998 US$)*	*GDP p.c. growth (%)*	*Exports (US$ millions)*	*Imports (US$ millions)*	*Rice production ('000 tons)*	*Rice exports ('000 tons)*
1990	13,645	5.10	206	–	2,404	2,752	19,225	1,624
1991	14,458	5.96	214	3.88	2,087	2,338	19,622	1,033
1992	15,708	8.65	228	6.54	2,581	2,541	21,590	1,946
1993	16,976	8.07	241	5.70	2,985	3,924	22,837	1,722
1994	18,477	8.84	258	7.05	4,054	5,826	23,528	1,983
1995	20,240	9.54	277	7.36	5,449	8,155	24,964	2,058
1996	22,130	9.34	298	7.58	7,256	11,144	26,397	3,047
1997	23,934	8.15	317	6.38	9,185	11,592	27,524	3,682
1998	25,322	5.80	331	4.42	9,360	11,500	29,146	3,793

Source: World Development Indicators database and Vietnam's General Statistical Office.

to play in designing and implementing anti-poverty policy. Furthermore, at a time when Vietnam is the subject of much scrutiny from academics and policy-makers alike, keen to understand the reasons why past reforms have had such a dramatic impact on poverty and how this might be repeated in the future, and indeed in other countries in the region, a clear understanding of the evolution of poverty is vital. We examine robustness to the choice of poverty line using poverty dominance analysis. This analysis also allows us to test the robustness of the fall in poverty to the choice of poverty measure. The second objective of the paper is related to the distribution of the gains from poverty reduction and examines whether poverty has fallen for all groups, or fallen by proportionately more. We examine the changing shape of the distribution of household consumption per capita and changes in the profile of poverty.

Section 2 briefly discusses the issues involved in poverty measurement and explains in more detail how robustness will be tested. Section 3 describes the Vietnamese household survey data, section 4 presents our results on robustness of poverty estimates to the choice of the poverty line and section 5 examines whether poverty reduction was distributed evenly across regions and population sub-groups. Section 6 presents our analysis poverty dynamics between 1992–93 and 1997–98 using transition matrices, and section 7 estimates a model of rural consumption growth. Section 8 concludes.

Table 2 Falling poverty and improving social indicators

		1992/93	*1997/98*
Consumption per capita[a]	Mean	1,915	2,764
	Median	1,587	2,111
Consumption poverty incidence (%)[b]	National	58	37
	Urban	25	9
	Rural	66	45
Lower secondary enrolment rate (%)[b]	Female	29	62
	Male	31	61
Child malnutrition (%)[b]	Female	51	33
	Male	50	35
Adult malnutrition (%)[b]	Female	32	30
	Male	32	25
Access to clean water (%)[b]	Rural	17	29
	Urban	60	75

Sources:
a Authors' calculations from *Vietnam Living Standards Surveys* 1992/93 and 1997/98 (full cross-section samples in each year).
b World Bank (1999).
Note: Consumption levels are annual total household consumption per capita in thousands of January 1998 Vietnamese dong.

2. MEASURING POVERTY

Measuring poverty, as Sen (1981) describes, involves two key steps: identification of the poor and aggregation into a summary measure. Each of these steps involves a number of decisions and choices and each of these can influence both who is identified as being poor and the value that the poverty measure takes. Hence any analysis of poverty, whether it is concerned solely with measurement or broader issues of the impact of policy, must be cognizant of these issues. Indeed, any estimate of poverty can only be fully understood when the underlying assumptions and decisions used in deriving that estimate are transparent.

This paper focuses on examining how robust estimates of poverty, and of changes in poverty, are to two key choices: the equivalence scale and the poverty line.

(a) Equivalence scales

In order to make meaningful comparisons of living standards between households it is necessary to account for inter-household differences in the household size and composition of families or households. Common practice in poverty assessments is to use per capita adjusted indicators of living standards (e.g. household consumption expenditure per capita) which has led to the general consensus that there is an inverse relationship between household size and welfare, i.e. that larger households are more likely to be poor. However, this relationship is substantially weakened when other ways of adjusting household-level indicators are used, i.e. when equivalence scales that adjust the size of the household into a per adult equivalent by assuming that generally children 'cost' less than adults. Applying such an equivalence scale has the effect of shifting households with children up the distribution, and in doing so potentially changing the composition of the poor population.[3] In section 7 below we examine the effect on estimating poverty dynamics of moving from a per capita definition to a per adult equivalent definition.

(b) Poverty lines

Once an indicator of poverty has been chosen some threshold that identifies the poor and hence the non-poor must be selected. However, the concept of a poverty line as a basis for measuring poverty has been the source of much controversy. Generally for developing countries, poverty lines are defined in absolute standards, usually defined as the cost of purchasing a typical bundle of goods, defined either in terms of calorie consumption or a wider set of food and non-food items, or as the expenditure necessary to achieve a specific calorie intake, adjusted for non-food requirements. Within each method there is also scope for estimating different poverty lines. The choice of poverty line is often the most arbitrary decision but one which is usually the most crucial. If large numbers of people have

incomes or expenditures close to the chosen poverty line, varying the poverty line by a few per cent can lead to dramatic changes in not only the estimates of the level of poverty at any one point in time but also the change in poverty over time. The choice of poverty line is the focus of our attention in this paper as we seek to examine how robust the fall in poverty in Vietnam is to changes in the poverty line and how the pattern of poverty dynamics change if the poverty line is varied. The technique of poverty dominance analysis (described below) allows us to make generalisations about the change in poverty over time without having to commit to a particular, arbitrary, poverty line.

3. THE VIETNAMESE SURVEY DATA

This paper examines poverty measurement issues in Vietnam using household consumption data provided in the *Vietnam Living Standards Surveys* (VLSS) for 1992–93 and 1997–98. The VLSS data are obtained from nation-wide nationally representative household surveys conducted in 1992–93 (October 1992 to October 1993) and 1997–98 (December 1997 to December 1998).[4] The household survey component provides detailed information on schooling, health, employment, migration, housing, fertility, agro-pastoral activities, non-farm self-employment, food expenses and home production, non-food expenditure and consumer durables, credit and saving and some anthropometric variables. The commune questionnaire includes information on demographic variables, economy and infrastructure, education, health and a separate price questionnaire.

In 1992–93 4,800 households in 120 communes were surveyed. The 1997–98 survey includes 6,000 households (approximately 4,000 households from the original 1992–93 sample) and 150 communes. The VLSS surveys are particularly useful as they allow the construction of a panel of 4,303 households interviewed in both years that can be used to explore movements in and out of poverty over time.[5] Finally, although rural-to-urban migration is undoubtedly an important phenomenon in Vietnam (see Nguyen *et al.* 1999; Zhang *et al.* 2001), the VLSS do not track households that migrate, so our panel cannot be used to explore hypotheses about relationships between migration and poverty status.[6]

We derive from the VLSS two indicators of living standards: first, annual total household consumption expenditure per capita and, second, annual total household consumption expenditure per equivalent adult, using an equivalence scale where adults are assigned a weight of 1 and children (those aged below 14) a weight of 0.65.

4. IS THE REDUCTION IN POVERTY IN VIETNAM ROBUST TO MEASUREMENT CHOICES?

The most commonly used poverty lines in Vietnam are those estimated by the World Bank (1999) and the Ministry of Labour, Invalids and Social Affairs

(MOLISA) (see Nguyet 1999; Jamal and Jansen 1998). Table 3 shows a brief overview of some of the poverty lines available for Vietnam. The World Bank provides a general (food and non-food) poverty line and a food-only poverty line. The food-only poverty line is based on the food consumed per person per day of the third quintile of the population, which yields approximately 2,052 calories, calculated from the VLSS. Quantities of each item in the food basket are scaled up to yield 2,100 calories per person per day and then priced using regional and monthly price indices to give a food poverty line for 1992/93 of 749,722 dong per person per year in January 1993 prices. The general poverty line incorporates non-food expenditures and is based on average non-food expenditures of the third quintile, adjusted by regional and monthly prices and by the calorie adjuster of 2,100/2,052 yielding an average non-food expenditure of 410,690 dong, and so a general poverty line for 1992/93 of 1,160,000 dong in January 1993 prices. The 1992/93 food basket is then revalued using regional and monthly prices for those items to give a 1997/98 food poverty line of 1,287,000 dong in January 1998 prices. The 1997/98 general poverty line is calculated by scaling up the 1992/93 non-food expenditure by the official consumer price index and then added to the 1997/98 food poverty line, yielding a 1997/98 general poverty line of 1,790,000 dong in January 1998 prices.[7,8]

Table 3 Poverty lines for Vietnam

	Value per annum ('000 dong)[a]	
	1992–93	*1997–98*
World Bank		
Food only	750	1,287
General	1,160	1,790
MOLISA		
Rural	434	750[b]
Urban	543	1,080
Jamal and Jansen		
Rice only	369	518
Rice and sauce	488	703
General	748	1,135[c]

Source: Jamal and Jansen (1998); Nguyet (1999); World Bank (1999).
Notes:
a 1992/93 poverty lines are shown in January 1993 prices; 1997/98 in January 1998 prices.
b Average of poverty lines for rural households in different regions (mountainous countryside and islands, and delta countryside and midlands).
c Jamal and Jansen general poverty line for 1997/98 is computed by inflating the 1992/93 general poverty line using annual consumer price inflation.

The World Bank poverty lines have been criticized on a number of grounds. First, in a country as poor as Vietnam, a poverty line that estimates that half the population is poor (as the World Bank general poverty line does) may not be the most appropriate for poverty targeting. Hence, MOLISA estimated a poverty line based on only the monetary value of rice consumption (the most important staple in Vietnam) and concentrates on the poorest households, i.e. 'starving' or hungry households with very minimal rice consumption (13 kilograms per month). This translates into 1,600 calories per day, yielding poverty lines for the urban and rural sectors that are much lower than those of the World Bank.

The World Bank's poverty lines have also been criticized by Jamal and Jansen (1998) on the grounds that the consumption of the third quintile cannot be considered representative of the typical consumption patterns of the poor and poverty lines based on the food basket of the third quintile will overestimate the extent of poverty. Jamal and Jansen construct an alternative food poverty line using estimates of rice consumption only. When a varied diet is considered important, they use estimates for 'rice and sauce' consumption, where 'sauce' includes the cheapest non-rice items. They also provide estimates for a food and non-food poverty line where the food basket contains rice and sauce. Again these poverty lines are lower than those obtained by the World Bank.

Hence it can be seen that there is some debate about where the poverty line should be set to adequately capture the notion of monetary poverty. Anyone unwilling to hold hostages to fortune over a particular poverty line needs to find a way of evaluating how robust the fall in poverty is to the choice of poverty line. One method is to calculate the value of a range of measures using a range of poverty lines and then compare the direction and magnitude of the change over time. But this is cumbersome, involves unnecessary computation and leaves open the possibility that a 'new' poverty line will emerge, rendering the analysis incomplete.

An alternative and preferable technique is to use poverty dominance analysis. This technique allows the researcher to compare distributions of the chosen poverty indicator and make generalizations about the direction and extent of poverty changes without ever having to commit to a particular poverty line. The worst-case scenario is that poverty rankings will be made for only a subset of poverty lines, but it is often possible to make poverty rankings that are robust to the entire range of possible poverty lines. Furthermore, the technique has the advantage of allowing the researcher to make generalizations about poverty rankings about poverty measures belonging to a wide range of poverty measures rather than just the one or two measures (e.g. the headcount ratio and the poverty gap) that are usually calculated.

Consider a cumulative distribution function (c.d.f.) of the indicator of living standards. This is a plot of, in our case, expenditure per capita on the horizontal axis and the cumulative probabilities on the vertical axis. From this plot we can read off from the vertical axis the proportion of the population that is below any

given expenditure level – or poverty line. Hence the c.d.f. can be used to estimate the value of the headcount ratio for a particular poverty line, and by varying the poverty line we can examine how the headcount ratio varies. By plotting two c.d.fs on the same graph, e.g. for two different years, we can make comparisons about the value the headcount ratio takes for different poverty lines. Consider the case of two distributions, A and B, shown in Figure 1. Wherever distribution A lies below (or at least not above) distribution B we can conclude that for that range of expenditure levels (i.e. poverty lines), the headcount ratio in A is less than in B, i.e. distribution A exhibits poverty dominance over distribution B.[9] In Figure 1 it is possible to see that for any given poverty line or income level, the c.d.f. of distribution B gives a higher headcount than that of distribution A.

A particularly powerful result demonstrated by Atkinson (1987) is that if we can establish first-order dominance for a range of poverty lines, $[z^{-}, z^{+}]$, where z^{-} is a lower poverty line (maybe zero but any other value will do) and z^{+} an upper poverty line, then it is possible to conclude that any poverty measure that is invariant to changes in income above the poverty lines (i.e. Sen's focus axiom[10]), for example all those in the Foster *et al.* (1984) FGT(α) class[11] (which includes the headcount ratio and the poverty gap) and many more besides, will rank distribution A as having lower poverty than distribution B. Poverty dominance analysis is therefore an extremely powerful tool for poverty researchers. It allows one to

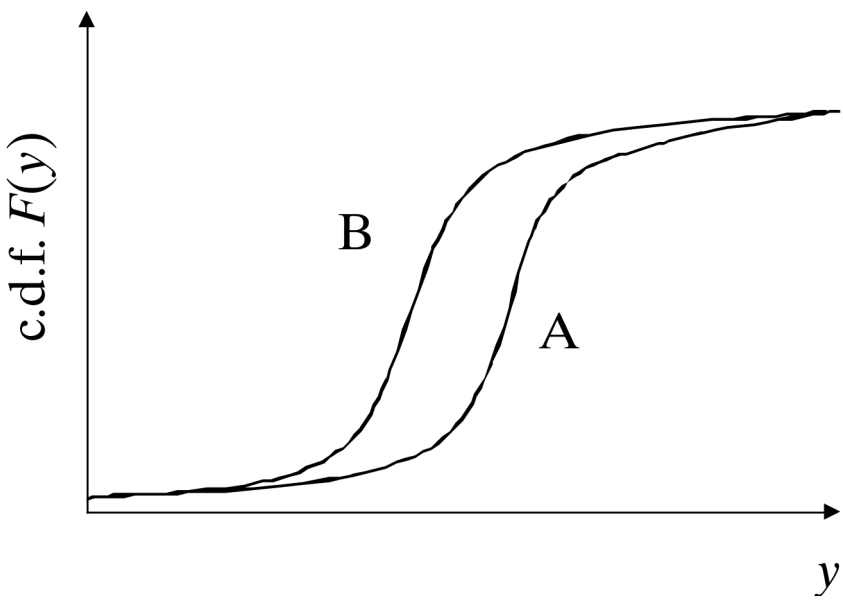

Figure 1 Distribution A displays poverty dominance over distribution B

abstract from any specific poverty line and from any one specific poverty measure without having to calculate each possible poverty measure for each possible poverty line.

Let us turn now to the Vietnam distributions. The c.d.fs of real annual household expenditure per capita for Vietnam in 1992/93 and 1997/98, each valued in 1998 Vietnamese dong, for the two full cross-section samples in each year, are shown in Figure 2, which shows a shift in the whole distribution between 1992–93 and 1997–98. Inspection of the graph shows that the c.d.f. of 1997–98 is always below the c.d.f. for 1992–93. The result can be more clearly visualized in Figure 3, which shows the same c.d.fs for consumption expenditures below 2 million dong, i.e. for the neighbourhood around and below the World Bank's general poverty line of 1,790,000 dong (and the highest poverty line that has been used to date for Vietnam). This allows us to see more clearly that regardless of where we draw the poverty line, the c.d.f. of the 1992/93 distribution lies everywhere above that of 1997/98; hence, poverty dominance of 1997/98 over 1992/93 is established for the entire range of plausible poverty lines.

The results obtained from the dominance analysis confirm that poverty did indeed decrease in Vietnam between 1992–93 and 1997–98 and that this result is independent of any national poverty line used. Furthermore, because we can establish first-order dominance, we can also conclude that not just the headcount ratio but any poverty measure that belongs to the FGT(α) class or even more

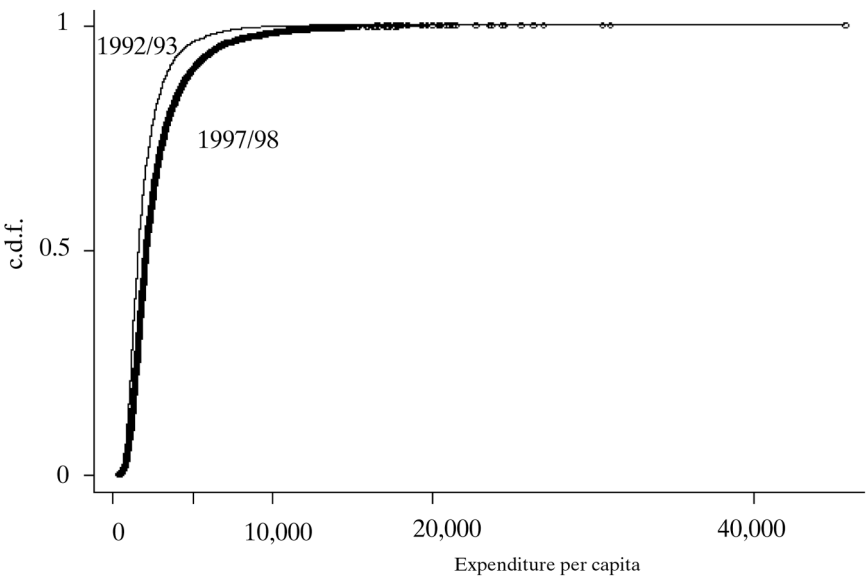

Figure 2 Cumulative distribution functions, 1992/93 and 1997/98

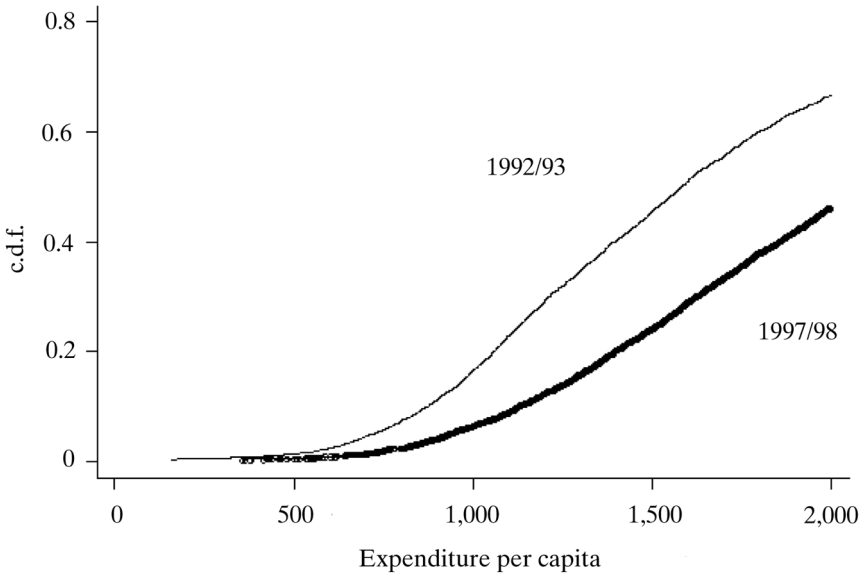

Figure 3 Cumulative distribution functions below 2 million dong

generally any poverty measure that satisfies Sen's focus axiom will record a decline in poverty between the two years.

5. WAS POVERTY REDUCTION EVEN?

The cumulative distribution functions shown in Figures 2 and 3 reveal that the entire distribution of household expenditure per capita shifted upwards during the 1990s, allowing us to conclude that poverty reduction did indeed occur, regardless of where we choose to draw the poverty line. But what the c.d.fs do not reveal is whether all sub-groups of the population experienced poverty reduction, or to the same extent. We analyse whether poverty reduction was in fact even by firstly examining changes in the distribution of household expenditure per capita and secondly examining changes in the poverty profile. Table 4 shows some simple summary statistics for Vietnam in 1992–93 and 1997–98.

Table 4 also shows that inequality increased in Vietnam between 1992–93 and 1997–98. Although all decile groups benefited from increases in their mean per capita consumption levels between 1992–93 and 1997–98, the share in consumption expenditure of the eight bottom decile groups has decreased, whereas the shares of the two top deciles have increased by 1.41 and 6.19 per cent respectively. These results suggest that although everyone benefited from the strong economic performance experienced in Vietnam, some groups did so more than others.

Table 4 Summary statistics for Vietnam, 1992–93 and 1997–98

	1992/93	*1997/98*	*% change*
Decile means			
1	699	918	31.4
2	978	1,281	31.0
3	1,140	1,522	33.5
4	1,310	1,743	33.1
5	1,497	1,980	32.3
6	1,691	2,270	34.2
7	1,956	2,657	35.9
8	2,347	3,203	36.5
9	2,980	4,191	40.7
10	5,354	7,875	47.1
Decile shares			
1	3.5	3.3	–5.1
2	4.9	4.6	–5.9
3	5.7	5.5	–3.3
4	6.6	6.3	–4.0
5	7.5	7.2	–4.4
6	8.5	8.2	–3.3
7	9.8	9.6	–1.7
8	11.8	11.6	–1.4
9	14.9	15.1	1.4
10	26.8	28.5	6.2

Source: Authors' calculations from *Vietnam Living Standards Survey* 1992–93 and 1997–98 (full cross-section samples in each year). Means in '000 dong.
Notes: 1992/93 means are shown in January 1993 prices; 1997/98 in January 1998 prices.

We can see this more clearly when we examine the shape of the consumption expenditure distribution. One way of doing this is to plot the kernel density estimates of the distribution.[12] Figure 4 shows that the 1997–98 distribution lies to the right of 1992–93 distribution but it appears that the upper tail has shifted upwards by proportionately more than the lower tail, suggesting an increase in inequality during the period.

This conclusion is further confirmed by the analysis of the incidence of poverty disaggregated by various socio-economic groups. Table 5 shows the profile of poverty for the World Bank's upper poverty line of 1,790,000 dong (per year per capita) in 1998 prices. The results show clearly that poverty improvements varied a lot between groups. For example, urban households benefited from a 63.9 per cent decrease in poverty between 1992–93 and 1997–98, whereas poverty amongst rural households decreased by only around one-half of that value. Households living in the Northern Uplands and in the Central Highlands benefited from a 25 per cent decrease in poverty between 1992–93 and 1997–98, whereas households living in the Southeast registered an almost 77 per cent decrease in

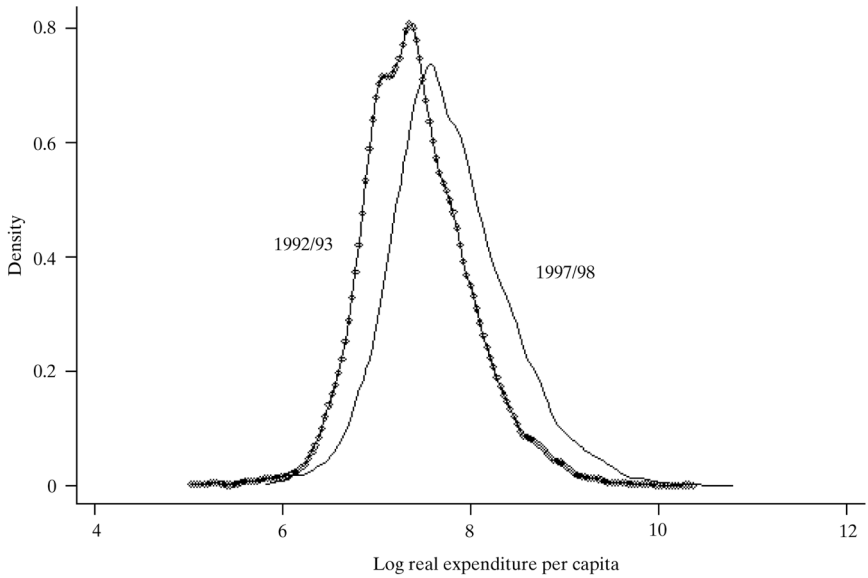

Figure 4 Kernel density estimates, 1992/93 and 1997/98

poverty between the two years.[13] Households belonging to the major ethnic group (Kinh) benefited from the largest decrease in poverty in relation to other ethnic groups, while poverty amongst the minority Dao group even increased, although given the small sample size of Dao this is not likely to be statistically significant.[14] Further evidence that not all groups experienced poverty reduction to the same extent is observed for other population sub-groups: households in which the head has a white-collar job[15] and higher levels of education[16] have had larger decreases in poverty than households in which the head has other jobs and lower levels of education.

6. POVERTY DYNAMICS IN VIETNAM

From the descriptive analysis above we can conclude that poverty reduction was not even: some expenditure groups benefited more than others as did some socio-economic groups. It is possible that these aggregated descriptives mask further differences within the population, i.e. differences in poverty dynamics.

In order to understand fully the nature of poverty in Vietnam, it is important to know whether poverty is simply a transitory state or a persistent phenomenon for certain groups. This information may be central for the design and targeting of policies aimed at reducing poverty. We therefore turn our focus away from changes in poverty rates across groups in the full cross-sectional samples in each

Table 5 Changes in poverty by socio-economic characteristics

	Headcount index			*Population share*	
	1992–93	*1997–98*	*% change*	*1992–93*	*1997–98*
All Vietnam	58.1	37.4	–35.6	100.0	100.0
Sex of the head					
Male	61.0	39.9	–34.6	77.5	78.4
Female	48.2	28.2	–41.5	22.5	21.6
Urban/rural					
Urban	24.9	9.0	–63.9	19.9	20.9
Rural	66.4	44.8	–32.5	80.1	79.1
Region					
Northern Uplands	78.6	58.6	–25.4	15.6	17.9
Red River Delta	62.8	28.7	–54.3	21.6	19.6
North Central	74.5	48.1	–35.4	12.8	13.8
Central Coast	49.6	35.2	–29.0	11.9	10.7
Central Highlands	70.0	52.4	–25.1	3.2	3.7
Southeast	32.7	7.6	–76.8	12.6	12.8
Mekong River Delta	47.1	36.9	–21.7	22.4	21.5
Ethnic group					
Vietnamese (Kinh)	55.1	31.7	–42.5	84.5	83.8
Tay	81.3	63.2	–22.3	2.0	1.9
Thai	82.3	71.1	–13.6	1.0	1.1
Chinese	11.8	8.4	–28.8	2.5	2.0
Khome	75.4	57.5	–23.7	2.0	2.0
Moung	89.6	80.6	–10.0	2.0	2.4
Nung	91.8	72.5	–21.0	1.6	1.9
H'mong	100.0	91.8	–8.2	0.7	0.8
Dao	88.5	100.0	13.0	0.3	0.3
Other	90.0	84.5	–6.1	3.5	3.8
Occupation of the head					
White collar	23.6	9.9	–58.1	4.6	6.6
Sales	27.7	13.0	–53.1	8.1	9.5
Agriculture	69.0	48.2	–30.1	64.7	61.0
Production	45.9	26.0	–43.4	10.9	11.5
Other/no work	44.4	27.4	–38.3	11.7	11.3
Education of the head					
No schooling	62.6	55.0	–12.1	36.4	8.4
Primary	56.7	42.2	–25.6	26.1	34.9
Low secondary	64.0	38.0	–40.6	22.6	36.3
Upper secondary	44.5	25.1	–43.6	4.3	12.3
Technical or university	39.2	14.2	–63.8	10.6	8.1

Notes: Authors' calculations from VLSS 1992–93 and 1997–98 (full cross-sectional samples in each year).

year to movements in and out of poverty (poverty dynamics), thereby taking advantage of the important panel dimension of the Vietnamese household surveys.

Table 6 shows estimates of probabilities of moving in or out of poverty, remaining poor, or remaining non-poor between 1992–93 and 1997–98. Note that these are unconditional probabilities in the sense that they do not control for characteristics of the individuals in each poverty transition state. The table includes estimates using the World Bank general poverty line and two other poverty lines, one 10 per cent above the World Bank poverty line and another 10 per cent below, each expressed in per capita terms. We have also included estimates based on using per adult equivalent consumption expenditure, with a poverty line adjusted by adult equivalent scales.[17]

The results in Table 6 suggest that almost 5 per cent of the population can be classified as having fallen into poverty between 1992–93 and 1997–98 (from the NP→P column) and that, depending on the poverty line we use, between 20 and 40 per cent of the population can be classified as being poor in both years. Despite the huge reduction in the poverty headcount and the opportunities presented by the *doi moi* reforms, a large proportion of the population who were initially poor remained poor, or were poor again, five years later.

We also present in Tables 7, 8 and 9 disaggregated estimates by examining poverty dynamics for households with different characteristics, analogous to the static poverty profile presented in section 5. We present figures for both the whole population and for just the rural population, where the majority of the poor live.

Generally, remaining poor and becoming poor are much more frequent among the rural population than among the population among the whole, suggesting that urban poverty transitions were primarily out of poverty or remaining non-poor. This confirms the story that poverty reduction was much greater in urban areas than in rural areas, as shown in Tables 2 and 5 above. Tables 7, 8 and 9 show that among the rural population rural households most likely to be poor in both years of the surveys were those living in the Northern Uplands, belonging to an ethnic minority, headed by a female,[18] with a younger head, a large number of children and other members, with a head employed in the agriculture sector and with low level of education.

The high levels of poverty in the Northern Uplands are most likely to be related to the remote and mountainous geography of the region, which does not allow the development of agriculture and the establishment of adequate infrastructure (World Bank 1999). As such, households that live in the southern regions are much more likely to be non-poor in both years. Households living in the Mekong River Delta have, however, the highest probabilities of having fallen into poverty in 1997–98. This is likely due to the high number of landless households in the Mekong River Delta (Lam 2001), which have experienced a deterioration of their living standards. Hired labour in the agricultural sector is

Table 6 Poverty dynamics in Vietnam, 1992–93 and 1997–98 (per cent)

	P→P	*NP→P*	*P→NP*	*NP→NP*
WB per capita poverty line	28.7	4.7	27.3	39.2
WB +10%	36.3	4.5	26.5	32.8
WB –10%	21.0	4.5	26.8	47.8
Adult equivalent	39.2	4.8	25.8	30.1

Source: Own calculations from VLSS, 1992–93 and 1997–98 (panel households only).
Notes: Results apply to the panel of VLSS households, not the full cross-sectional samples. P→P indicates the probability of a household being classified as remaining poor in both years, NP→P the probability of falling into poverty between 1992–93 and 1997–98, P→NP the probability of escaping from poverty, and NP→NP that of remaining non-poor in both years.

more common in the Mekong River Delta than in any other regions in Vietnam and there has been an increase in the availability of jobs in the region, thanks to the introduction of double and triple cropping and the diversification of production (introduction and expansion of cash crops and shrimp farming). However, the availability of non-farm employment is still limited, and thus some landless people go to urban areas in search for work (Lam 2001). This may partially explain why so many households in the Mekong River Delta have fallen into poverty in 1997–98, when this is one of the better-off regions inVietnam.[19]

Table 7 Poverty transitions: geographic and ethnic characteristics

	% of rural panel		*P→P*		*NP→P*		*P→NP*		*NP→NP*	
	1992–93	*1997–98*	*All*	*Rural*	*All*	*Rural*	*All*	*Rural*	*All*	*Rural*
Region										
Northern Uplands	16.5	16.5	47.2	54.8	4.5	4.8	27.3	25.6	21.0	14.7
Red River Delta	25.0	25.0	24.9	29.1	3.9	4.0	34.7	39.0	36.6	27.6
North Central	15.7	15.7	38.1	41.1	4.1	4.6	33.7	33.3	24.1	21.1
Central Coast	10.7	10.7	25.2	30.0	4.0	4.8	23.0	25.1	47.9	40.1
Central Highlands	3.3	3.3	41.7	41.7	2.6	2.6	25.2	25.2	30.4	30.4
Southeast	8.5	8.5	8.0	10.8	2.1	3.0	24.2	33.1	65.8	53.0
Mekong River Delta	20.2	20.2	23.9	27.2	8.6	9.8	18.7	20.4	48.8	42.7
Ethnic group										
Kinh	84.8	84.6	23.8	28.0	4.7	5.4	29.1	31.9	42.3	34.8
Chinese	0.4	0.3	5.7	28.0	1.3	0.0	5.7	8.0	87.3	64.0
Others	14.9	15.1	65.9	67.7	5.3	5.3	18.1	17.6	10.7	9.5

Source: Authors' own calculations from the VLSS, 1992–93 and 1997–98 (panel households only).

The tables show also that households with younger heads have a higher probability of being poor in both years. This probability decreases with increases in the age of the head. We believe that this result is associated with the fact that households with young heads are likely to have young children, which poses a financial burden on the household. This is confirmed by the fact that the probability of being poor in both years increases with the number of children in the household. This may be related to the costs of educating children, which soared in Vietnam after the implementation of the economic reforms (World Bank 1999). However, while education has certainly become more costly, there is evidence below that higher levels of education are associated with lower incidence of poverty, suggesting that while investment in education may be temporarily costly in terms of current living standards, the returns in the longer run are significant. Finally, the number of households with large numbers of children decreased between 1992–93 and 1997–98, a result likely to be associated with the economic incentives provided by the Vietnamese government to families with just one child.

Table 8 Poverty transitions: demographic characteristics

	% of rural panel		*P→P*		*NP→P*		*P→NP*		*NP→NP*	
	1992–93	*1997–98*	*All*	*Rural*	*All*	*Rural*	*All*	*Rural*	*All*	*Rural*
Gender of head										
Male	78.0	76.6	21.1	28.3	4.8	6.2	25.4	28.5	48.6	36.9
Female	22.0	23.4	31.5	35.5	4.7	5.1	28.0	30.0	35.8	29.4
Head age group										
Under 30	14.6	5.9	42.9	46.2	7.9	8.1	27.3	28.3	21.9	17.5
30 to 60	66.6	73.1	29.0	34.3	4.1	4.6	28.0	30.6	39.0	30.5
60 and above	18.9	21.0	21.6	26.0	5.6	6.7	25.2	27.3	47.6	40.0
No. of children per household										
≤ 2	65.2	74.3	21.3	26.5	5.2	6.2	27.4	30.5	46.0	36.9
2–5	28.7	22.3	45.6	48.3	3.5	3.6	28.5	29.2	22.4	18.9
≥ 5	6.1	3.4	64.2	65.7	3.1	3.0	19.9	20.2	12.9	11.1
Household size										
≤ 3	22.7	22.4	17.9	22.3	5.6	6.7	27.0	30.1	49.5	40.9
3–6	40.4	45.2	26.4	31.5	4.5	5.1	28.9	31.8	40.2	31.6
≥ 6	36.9	32.4	39.4	44.3	4.4	4.8	25.5	26.8	30.7	24.0

Source: Authors' own calculations from the VLSS, 1992–93 and 1997–98 (panel households).
Note: Children are those aged 0–14.

Table 9 shows that households in which the head works in the agriculture sector have the higher probability of being poor in both years. However, the number of heads employed in white-collar jobs, sales and production increased between 1992–93 and 1997–98, whilst the number of heads working in the agriculture sector decreased in the same period. Although there was a slight increase in the percentage of unemployed heads, the increase in the percentage of heads in occupations other than the agriculture sector is bound to have contributed towards the decrease in poverty levels.

Table 9 Poverty transitions: labour and education characteristics

	% of rural panel		*Always poor (%)*		*Non-poor 1992–93 Poor 1997–98 (%)*		*Poor 1992–93 Non-poor 1997–98 (%)*		*Never poor (%)*	
	1992–93	*1997–98*	*All*	*Rural*	*All*	*Rural*	*All*	*Rural*	*All*	*Rural*
Occupation of the head										
White collar	3.41	4.29	6.34	11.15	1.69	2.60	17.76	27.14	74.21	59.11
Sales and services	4.26	5.44	8.70	15.04	3.87	5.60	18.65	25.96	68.78	53.39
Agriculture	75.19	71.84	36.18	37.45	5.35	5.49	30.02	30.06	28.44	27.00
Production	7.81	8.21	20.33	27.86	3.98	4.46	28.73	33.57	46.96	34.11
Unemployed	9.33	10.22	21.35	30.31	4.23	6.00	22.58	26.50	51.83	37.19
Education of head										
None	39.30	10.85	37.33	41.44	5.35	5.71	23.81	23.97	33.51	28.88
Primary	24.53	37.72	29.22	33.20	5.88	6.53	26.77	28.83	38.13	31.45
Lower secondary	24.10	35.89	29.02	33.30	4.48	4.77	33.45	35.35	33.05	26.57
Upper secondary	3.98	9.62	18.81	25.68	2.54	3.37	23.13	28.42	55.52	42.53
Technical or university	8.10	5.92	13.00	20.41	2.23	3.27	22.52	30.82	62.25	45.51
Education of spouse										
None	37.44	9.79	38.36	41.52	5.40	5.70	25.18	26.12	31.06	26.67
Primary	17.40	32.57	28.85	31.84	5.04	5.21	27.73	29.84	38.39	33.10
Lower secondary	17.46	27.07	31.61	37.21	4.52	4.95	30.93	33.87	32.93	23.97
Upper secondary	2.83	6.12	20.71	29.07	4.90	6.71	26.50	31.63	47.88	32.59
Technical or university	4.52	3.41	8.27	14.44	1.61	2.53	23.59	30.32	66.53	52.71

Source: Authors' own calculations from the VLSS, 1992–93 and 1997–98 (panel households).
Note: The education level of the spouse of the household head refers only to those households with a spouse.

The most striking observation suggested by the estimates in Table 9 is the sharp decrease in the proportion of household heads and spouses with no education. Given that households in which the head has no education have the highest probability of being poor in both years, this change is likely to have affected positively the reduction of poverty in Vietnam.

The results reported above suggest that some households have benefited less than others from the reduction in poverty that took place in Vietnam between 1992–93 and 1997–98. These were the type of households expected to be associated with poverty in a poor rural economy such as Vietnam: large households living in remote rural areas, employed in the agriculture sector and endowed with low levels of human capital.

7. CORRELATES OF RURAL POVERTY IN VIETNAM

Although the analysis above provides some insight into the nature of poverty dynamics in Vietnam during the 1990s, the results so far have been based on unconditional probabilities rather than controlling for differences in other characteristics between households. We therefore turn now to estimating a model of consumption growth for the rural panel incorporating the characteristics above and other household- and commune-level data that are available in the survey.[20]

We estimate a model of the change in household consumption expenditure per capita (in logs) by considering initial 1992–93 values of a range of household and commune characteristics, including demographics, occupation of the head of the household, an illness shock[21] and a weather shock,[22] education levels of the head of the household and spouse, assets owned by the household (net income assets and remittances) and institutional and infrastructure characteristics. In order to control for noise in the data originated from sampling methods, the model contains a variable that represents the quarter in which the household was interviewed. We also include irrigated land per capita and rice production,[23] and a dummy for access to land.[24] The standard errors of the coefficients are corrected for unobserved heteroscedasticity in the household surveys using White's adjusted heteroscedasticity-consistent variances.

The results suggest, as do the poverty transition matrices, that there are strong regional effects. Households in the Mekong River Delta on average appeared to experience smaller increases in average consumption expenditure (per capita or per adult equivalent) than households in the reference region of North Central and any of the other regions. Households in the Red River Delta and those in the Southeast experienced, at the mean, much higher increases in living standards.

We also find that ethnic and religious minorities did worse than the majority Kinh and Buddhist groups. We find no significant difference between male- and female-headed households, and little effect of age on consumption growth. Households with more adults appear to have done better than those with fewer, perhaps suggesting that households with surplus labour in 1992/93 were able to take advantage of new opportunities and reduce underemployment through on-farm

diversification or employment off-farm. Households with more children than average also seem to have done better: increased productivity of family labour may be an explanation here. Education is clearly important: households with heads who have higher levels of education initially (i.e. in 1992–93) experienced much stronger growth of consumption than those with less education. Interestingly the effect of spouse education is not statistically significant.

Among the broad occupation categories used here, only those households with a head employed in sales appear to have done significantly worse than those employed in agriculture, although the coefficients on the agricultural variables suggest that there are subtler changes occurring within the agricultural sector.[25] Households initially producing large quantities of rice and with more irrigated land per capita seem to have experienced smaller growth in consumption than other farmers. At first glance, this result appears to be at odds with the results of Niimi *et al.* (2004, in this issue), who find that the quantity of rice production is associated with increased probabilities of escaping poverty. However, their results also show that this positive effect is reduced in the two main rice-producing areas, especially the Mekong Delta.[26] The results taken together most probably reflect the larger gains to be had from diversifying out of rice into other agricultural activities, such as coffee, fruit and other products.[27] Note, finally, that households interviewed in the second quarter seem to have increased consumption growth than households interviewed in the third quarter. These results are related to variable weather and agriculture conditions in Vietnam during the period.

Finally, we found that few commune-level characteristics played a statistically significant role in determining consumption growth: communes with better physical connections appear to have been more successful than others, as we would expect, and communes with primary schools also seem to have done better than those without. Weather shocks seem to have been important with communes experiencing adverse weather conditions between the two surveys experiencing poorer growth in consumption than average.

8. CONCLUSIONS

This paper described and analysed changes in poverty in Vietnam during the 1990s. We explored the sensitivity of the measured reduction in poverty, the composition of the poor and the broad pattern of poverty dynamics to the choice of poverty line, equivalence scale and poverty measure and found a generally consistent story. In particular, we can conclude that poverty did fall between 1992–93 and 1997–98, wherever we choose to set the poverty line and whichever poverty measure we choose.

The paper also shows, however, that not everyone in Vietnam benefited from the broad improvement in living standards. Standard methods of distributional analysis show that inequality increased during the period and poverty transition matrices show that not all socio-economic groups did as well as others. Indeed, some groups, namely ethnic minorities, appear to have become worse off in absolute terms.

Table 10 Consumption growth models for rural Vietnam

	Change in household consumption expenditure per capita (logs)	*Change in household consumption expenditure per adult equivalent (logs)*
Region (North Central)		
Northern Uplands	–0.044*	–0.046*
Red River Delta	0.059**	0.053**
Central Coast	–0.120***	–0.119***
Central Highlands	0.008	0.035
Southeast	0.064*	0.076**
Mekong River Delta	–0.177***	–0.171***
Ethnicity/religion (Kinh/not Buddhist)		
Chinese	–0.150	–0.127
Other ethnicity	–0.082***	–0.081***
Buddhist	0.087***	0.083***
Demographics		
Head is male (female)	–0.026	–0.021
Age of head	0.015	0.001
Age squared	–0.004	0.019**
Number of adults	0.034***	0.021**
Number of children	0.066***	0.059***
Illness (No illness)	–0.055*	–0.049
Education (none)		
Head Primary	–0.010	–0.019
Head Lower sec.	0.046**	0.037
Head Upper sec.	0.078*	0.073*
Head Technical/university	0.055*	0.044
Household no spouse	0.015	0.019
Spouse Primary	0.018	0.022
Spouse Lower sec.	–0.008	0.001
Spouse Upper sec.	–0.078	–0.053
Spouse Technical/university	–0.011	–0.007
Occupation of head (agriculture)		
White collar	0.011	0.009
Sales	–0.076*	–0.081*
Production	–0.028	–0.024
Unemployed	–0.018	–0.014
Agricultural production		
Irrigated land per capita	–0.037***	–0.036***
Rice production	–0.037***	–0.038***
Access to land (none)	0.087**	0.086**
Weather shock (none)	–0.007***	–0.007***
Income assets	–0.002	–0.002
Remittances (none)	0.029	0.027

Table 10 Continued

	Change in household consumption expenditure per capita (logs)	*Change in household consumption expenditure per adult equivalent (logs)*
(1st quarter)		
2nd quarter	0.064**	0.067***
3rd quarter	–0.069***	–0.071***
4th quarter	–0.022	–0.025
Infrastructure		
Access to electricity (none)	–0.006	–0.011
Road	0.175***	0.174***
Lower sec. school	–0.074***	–0.069***
Upper sec. school	0.001	0.001
Post office	–0.006	–0.006
Daily market	0.012	0.008
Food shop	–0.021	–0.024
Primary school	0.314***	0.302***
Clinic	–0.005	–0.002
Constant	–0.027	–0.063
Observations	3,494	3,494
R-squared	0.13	0.13

Source: Authors' calculations from the VLSS, 1992–93 and 1997–98 (panel households only).
Notes: *** indicates a coefficient is statistically significantly different from zero at the 1 per cent level, ** at the 5 per cent level and * at the 10 per cent level. Entries shown in parentheses refer to the reference category for dummy variables.

A regression model of the change in consumption over time confirmed this, suggesting that as well as there being large differences in the performance of households in different regions, with different levels of education, different ethnicity and with different household composition, agricultural households heavily committed to rice production experienced poorer growth of consumption than did those households able to diversify into other crops and activities.

The results obtained in this paper suggest that the changes experienced in Vietnam during the 1990s are associated with significant effects on living standards and have been generally beneficial. The winners from the process of reforms appear to be those with better skills, with closer proximity to the key growth areas of Hanoi and Ho Chi Minh City, and those able to take advantage of the opportunities provided by the *doi moi* reforms, i.e. those able to diversify farm and off-farm activities. The losers from the reform process, a much smaller group, will need further incentives and assistance to follow the same path.

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NOTES

1 There is debate about both the beginnings and the extent of Vietnam's reform process. Although *doi moi* began in the late 1980s, some argue that Vietnam was already reforming in the very early 1980s. In addition, the reform process has been characterized by reversals and non-implementation of reforms (see Niimi *et al.*, in this issue, for an overview of trade reform in the 1990s).

2 See Justino and Litchfield (2003) for an analysis of the effects of agriculture diversification (amongst other economic changes) on poverty dynamics in Vietnam.

3 See Lanjouw and Ravallion (1995) on the relationship between household size and poverty, and White and Masset (2002) for a further critique and an application to Vietnam.

4 The VLSS datasets were collected by Vietnam's General Statistical Office and the Ministry of Planning and Investment, with financial assistance from the United Nations Development Program and the Swedish International Development Agency and technical assistance from the World Bank.

5 The 1992–93 survey is self-weighting, but the 1997–98 survey data require the use of sample weights to derive nationally representative estimates.

6 There are some data in the VLSS on whether members of households had previously migrated, when and to what destination, which could be used to test hypotheses about return migrants. While we acknowledge that this would be an interesting additional dimension to analysis of poverty in Vietnam, we judged this to be outside the scope of this present study.

7 The Vietnam General Statistics Office (GSO) provides an alternative poverty line, calculated using the same method as the World Bank but using income data from the *Multi-Purposes Household Surveys* and the *Survey on Wealth and Poverty* for 1993 (General Statistics Office 1995). Both poverty lines yield, however, similar poverty estimates in 1992–93 and 1997–98. See Nguyet (1999) for a discussion.

8 The dollar exchange rates in 1993 and 1998 were, respectively, 10,641 and 13,268 dong. Purchasing power parities were, however, much higher: in 1999 GNP in PPP terms was almost five times higher than GNP in US$ terms (World Bank 2003).

9 This is often referred to as first-order dominance as it relates to the first moment of the distribution.

10 Sen (1976) presents a set of desirable properties or axioms of poverty measures. The

focus axiom requires that any poverty measure P be unchanged for any changes in incomes of expenditures above the poverty line.

11 The FGT(α) class of poverty measures encompasses the headcount ratio, the poverty gap and the squared poverty gap. The general formula is

$$P(\alpha) = \frac{1}{N}\sum_{i=1}^{k}\left(\frac{z - y_i}{z}\right)^{\alpha}$$

where y_i is the income of individual i, z is poverty line, N is total population, k is number of poor people and α is a parameter that represents the degree of aversion to inequality among the poor. The headcount ratio is found by setting $\alpha = 0$, the poverty gap by $\alpha = 1$ and the squared poverty gap by setting $\alpha = 2$ (Foster *et al.* 1984).

12 Kernel density estimates are similar to histograms, in that they plot expenditures against their relative frequencies, but differ by applying weights (called a kernel function) to observations within each expenditure interval. The kernel plots here are created using log expenditure and a normal kernel function. See Cowell *et al.* (1999) for a discussion of kernel density plots of income and expenditure data.

13 For administrative purposes, Vietnam is divided into seven regions: Northern Uplands, Red River Delta and North Central in the north of the country, Central Coast and Central Highlands in the centre, and Southeast and Mekong River Delta in the south.

14 The VLSS specify eight ethnic groups: the Kinh (the Vietnamese majority), the Tay, the Thai, the Chinese, the Moung, the Nung, the H'mong and the Dao. All remaining ethnic groups are aggregated under the heading 'others'. See van de Walle and Gunewardena (2001) and Baulch *et al.* (2002) for more detailed analyses of poverty and ethnicity in Vietnam.

15 This variable was constructed using the list of profession codes provided in the household surveys. We have divided our occupation variable into white-collar jobs (scientists, architects, lawyers, economists, academics, clerical workers, etc.), sales and services (retail and wholesale workers, salesmen, hotel managers and workers, hairdressers, etc.), agriculture (farmers, forestry workers, fishermen, etc.), production (miners, masons, food-processing workers, shoemakers, painters, etc.) and those not working. See also Glewwe *et al.* (2000). The unemployed include those heads looking for a job and those who have no job.

16 We define education as the highest diploma or degree obtained by the head (or spouse of the head) of the household rather than the number of years the head and the spouse spend in school, as in Glewwe *et al.* (2000). We did not feel that number of years represented accurately the level of education of each individual since it is not perfectly comparable between the two household surveys and may include individuals that have reported a large number of years spent in school without having achieved a certain level of education.

17 We adjusted the per capita poverty line to a per adult poverty line by multiplying the poverty line by 2,800/2,100 (i.e. the ratio of the calorie needs of an adult to those of an average person).

18 However, male-headed households were slightly more likely to have fallen into poverty in 1997–98.

19 Readers should recall that the VLSS does not track households that migrate.

20 Our focus on the rural sector is justified by the fact that 78 per cent of all households in Vietnam in 1997–98 lived in rural areas (80 per cent in 1992–93) and 61 per cent of all Vietnamese households were employed in the agriculture sector in 1997–98 (65 per cent in 1992–93). Furthermore, two of the key economic reforms implemented in Vietnam (reform of rice pricing and rice trade and de-collectivization of the agricultural sector) were directed at the rural sector.

21 Where 1 if the household head lost more than seven work days due to illness in the month prior to the survey, 0 otherwise.
22 Where 1 if the commune suffered from adverse weather in any year between 1993 and 1998.
23 Irrigated land per capita is square metres of irrigated land per person. Rice production refers to kilograms of rice produced per household.
24 Land was owned solely by the state prior to the *doi moi* and land transactions were not allowed. After 1993, land tenure was extended to twenty years for annual crop land and fifty years for perennials. Households were also given extended rights to exchange, transfer, lease, inherit and mortgage land (Benjamin and Brandt 2002).
25 See Justino and Litchfield (2003) for detailed analysis of agricultural sector changes in Vietnam.
26 Niimi *et al.* (this issue) adopt a slightly different methodology, incorporating both the urban and rural sectors, and estimating a multinomial logit model of probabilities of entering and escaping poverty (i.e. crossing the poverty line) whereas we examine just the rural sector and changes in consumption.
27 This hypothesis is lent further weight when we examine the results of including variables that reflect changes in the explanatory variables, rather than just initial values, although this raises endogeneity problems.

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