Issues in Employment and Poverty

Discussion Paper

9

Employment Poverty Linkages and Policies for Pro-poor Growth in Vietnam

By

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Table of Contents

Preface

The experience of countries that succeeded in reducing poverty significantly indicates the importance of high rates of economic growth in achieving this. High growth, however, is not a sufficient condition for poverty reduction; the pattern and sources of growth as well as the manner in which its benefits are distributed are equally important from the point of view of achieving the goal of poverty reduction. And employment plays a key role in that context. Indeed, countries which attained high rates of employment growth alongside high rates of economic growth are also the ones who succeeded in reducing poverty significantly.

In view of the importance of employment as a route out of poverty, the ILO and SIDA agreed to collaborate in undertaking a series of studies to examine the linkage between economic growth, employment and poverty reduction. The present study on Vietnam, along with the studies on Bangladesh, Bolivia, Ethiopia, and Uganda, forms part of that series. The main purpose of these studies is to contribute to an understanding of the linkage mentioned above, and to the identification of policies that could be used to engender higher rates of economic growth and employment generation, and thus achieve a faster reduction in poverty.

During the 1990s, Vietnam's economy has achieved high rates of economic growth and an impressive reduction in poverty. While high growth was important, the pattern of growth played a vital role in reducing poverty. Rural households benefited from a diversification towards higher value crops and other products (e.g., livestock, aquaculture, and fruits), higher export orientation and a rise in the relative price of agricultural products. The linkage effect of agricultural growth was a high growth of non-farm employment, especially in rural areas. In the urban areas, redundant workers of state-owned enterprises could find jobs in the growing private sector.

The present study, however, argues that Vietnam could not realise the full potential for poverty reduction from its high growth due to a variety of factors. First, not all the poor could benefit equally from economic growth because of their low human capital, location (in remote and mountainous regions), and vulnerability. The country's comparative advantage in labour-intensive sectors has not been fully exploited. The shift in the structure of employment has been slower than that in GDP.

The study shows that the rate of poverty reduction slowed down after 1998, and points out that Vietnam may not be able to replicate its impressive achievements based on agricultural diversification and the initial spurt in private sector activities in urban areas. It argues that the sources of growth in the medium term future will need to shift towards the establishment of labour-intensive industries to generate employment for unskilled and semi-skilled labour in both rural and urban areas. The importance of an appropriate incentive structure, and improvements in physical infrastructure and human capital that are required to attain that shift has been pointed out by the study.

The analysis based on household level data provides useful insight into factors that enable poor people to get out of poverty, and thus on policies required to continue the impressive achievement in poverty reduction. They include policies to enhance the human capital of the poor through education and healthcare, improvements in physical infrastructure, easy access to credit, and social safety nets.

While funding provided by the Swedish International Development Cooperation Agency (SIDA) for the present study (and the others in the series) is thankfully acknowledged, mention should be made of Dr. Per Ronnas, Chief Economist, SIDA, who played a critical role in initiating this collaborative project. We would like to thank him for his personal interest, encouragement, and technical support (by way of suggestions and comments at various stages). Thanks are due to Ms. Rose Marie Greve, Director, ILO Office, Hanoi for her support in undertaking the study. In the Central Institute of Economic Management, Hanoi, we found a willing and capable collaborator.

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1. INTRODUCTION

In the mid-1980s Vietnam was among the world's 40 poorest countries, with about 75 percent of its population living in poverty. However, with the opening of the economy in the late 1980s, the Vietnamese economy became one of the ten fastest growing economies in the world. Impressive success in poverty reduction was also achieved during the 1990s. World-wide experience suggests that a high and sustained rate of economic growth is necessary for achieving a significant reduction in poverty. The nature and pattern of growth, as well as the way its benefits are distributed, are extremely important in determining whether economic growth succeeds in reducing poverty. In this regard, the importance of employment of labour (the most abundance endowment of the poor) should not be forgotten as it provides the key link between growth and poverty reduction. As poverty persists in many parts of the world, the experience of Vietnam in attacking poverty and providing employment opportunities for the poor may be relevant to other developing countries.

This study attempts to explore how rapid growth has been translated into substantial poverty reduction through output growth, employment generation, productivity, structural shifts in employment and changes in labour incomes. Descriptive and comparative analytical methods, including econometric methods, are adopted to examine these linkages at both macro and micro levels using cross-sections and time-series data.

The paper is organised as follows. Chapter Two provides an overview of economic performance and poverty reduction and examines causal relationships between them. Inter-linkages between economic growth, employment, productivity and poverty at the macro level is the subject of discussion of Chapter Three. Chapter Four examines the impact of different labour market variables in reducing poverty at the household level. Major findings and policy implications are presented in the final Chapter.

2. ECONOMIC GROWTH AND POVERTY DURING 1990s

2.1. Trend in Economic Growth Performance

The Vietnamese economy of the 1980s was a kind of 'modified' planned economy. By 1988, the failure of efforts to stabilise the economy as well as the expectation of the drying up of aid from the former Soviet Union had created an enormous pressure on reform. In March 1989, Vietnam adopted radical and comprehensive economic reforms aimed at stabilising and opening the economy, enhancing freedom of choice for economic units and introducing competition so as to create supportive policies and institutional environment for growth and poverty reduction in Vietnam. The reform measures included:

- More or less complete price liberalisation;
- Large-scale devaluation and unification of the exchange rate;
- Increases in interest rates to positive levels in real terms;
- Substantial reduction in subsidies to the state owned enterprises (SOE) sector;
- Agricultural reforms;
- Encouragement of the private sector;
- Removal of domestic trade barriers and creation of a more open economy.

The economic reform package of 1989 created the basic conditions required for the transformation of Vietnam into a market-oriented economy. The success of the reforms

resulted in spectacular economic growth over the period before the Asian crisis. During the 1990s the annual GDP growth rate averaged 7.2 percent with a period of rapid growth between 1991 and 1997, when it averaged 8.5 percent per annum. Per capita GDP rose by 1.8 times and the ratio of domestic savings to GDP increased by 3.2 times (Le Dang Doanh *et al* 2002). All sectors grew, albeit at different rates (Table 1). At the same time inflation was kept under control, at single-digit level. Industry grew at an average annual average rate of 9.6 percent, thereby enhancing entrepreneurial income and creating employment opportunities for unskilled labour. The services sector performed well too and the quality of services improved dramatically to support of growing private sector activities. From 1991 to 2000, the value of financial services increased by 3.2 times, education and training services rose by 2.2 times, health and related social services increased by 1.7 times, and the transport, storage and communication sector increased by 1.8 times (Socialist Republic of Vietnam (SRV) 2002).

Table 1: Major Macroeconomic Indicators, 1990-2000

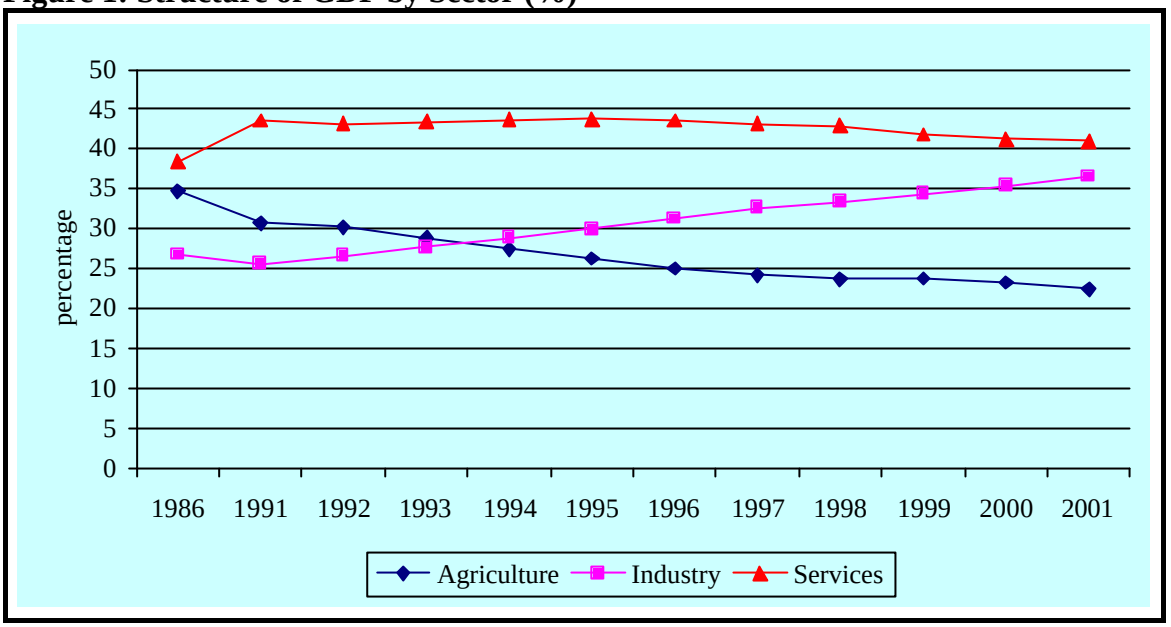
	1990	*1991*	*1992*	*1993*	*1994*	*1995*	*1996*	*1997*	*1998*	*1999*	*2000*	*2001*
GDP growth (%)	5.1	5.8	8.7	8.1	8.8	9.5	9.3	8.1	5.8	4.8	6.8	6.8
Agriculture	*1.0*	*2.2*	*6.9*	*3.3*	*3.4*	*4.8*	*4.4*	*4.3*	*3.5*	*5.2*	*4.0*	*2.7*
Industry[a)]	*2.3*	*7.7*	*12.8*	*12.6*	*13.4*	*13.6*	*14.5*	*12.6*	*8.3*	*7.7*	*10.1*	*10.4*
Services	*10.2*	*7.4*	*7.6*	*8.6*	*9.6*	*9.8*	*8.8*	*7.1*	*5.1*	*2.3*	*5.6*	*6.1*
Inflation (%)	67.1	67.6	17.5	5.2	14.5	12.7	4.6	3.6	9.2	0.1	-0.6	0.8
FDI (US$ mill)[b)]	839	1,322	2,165	2,900	3,766	6,531	8,497	4,649	3,897	1,568	2,000	2,503
Export (US$ mill)	2,404	2,087	2,581	2,985	4,054	5,449	7,256	9,185	9,360	11,540	14,483	15,027
Annual growth (%)	*23.5*	*-13.2*	*23.7*	*15.7*	*35.8*	*34.4*	*33.2*	*26.6*	*1.9*	*23.3*	*25.5*	*3.8*
Import (US$ mill)	2,752	2,338	2,541	3,924	5,826	8,155	11,144	11,592	11,499	11,742	15,637	16,162
Annual growth (%)	*7.3*	*-15.1*	*8.7*	*54.4*	*48.5*	*40.0*	*36.6*	*4.0*	*-0.8*	*2.1*	*33.2*	*3.4*

***Note**: a) Including construction; b) Total commitments, including Vietnam's contribution.*
***Source**: General Statistical Office (GSO) (various years).*

Between 1989 and 1995 growth was driven by services that contributed in 1990 for about 82 percent of GDP growth. After 1995 manufacturing took the lead, although it had already begun making a good contribution to GDP since 1992. As is evident from Figure 1, there was a significant change in the industrial structure of the economy. The share of manufacturing in GDP increased from 13.1 percent in 1991 to 18.7 percent in 2000, reflecting a pattern similar to that experienced by Indonesia, Malaysia and Thailand during the early stages of their industrialisation. Although the relative importance of the agricultural sector in GDP declined, it made impressive progress with an average annual growth rate of 5.6 percent over 1990s. Since 1989, Vietnam has not only been able to ensure food security at the national level: it has also turned from a net food importer into one of the largest exporters of rice, coffee, pepper and cashew nut.

As demonstrated in Table 1, the expansion of international trade has been one of the most important factors in Vietnam's economic growth. Vietnam boosted its exports from 2,404 million US$ in 1990 to 15,027 million US$ in 2001 with a substantial shift away from member-countries of the Council of Mutual Economic Assistance towards the rest of the world. The high growth rates in Vietnam during the period 1992 to 1997 were associated with substantial annual rates of export growth of over 20 percent during the last decade. In terms of its share of GDP, exports made significant contribution, rising from 22.2 percent in 1990 to 25.1 percent in 1995, and 45.6 percent in 2001. This was the result of a more outward looking trade policy and export promotion measures. The sector with foreign investment became an integrated part of the economy and played a limited role in transferring technology, management and working skills.

Figure 1: Structure of GDP by Sector (%)



***Data source**: GSO (various years).*

The economy suffered some slowdown over the period 1998-99, as the impact of the regional economic crisis was felt. There has been steady recovery since, although growth rates continued to be lower than in the first half of 1990s. In late 1990s, the pace of sectoral shifts was also slower than in the early 1990s. The service sector, which accounted for the largest single component of GDP, reversed its trend in the second half of the 1990s, and began a relative decline from 43.8 percent in 1995 to 41.0 percent in 2001.

Several major factors contributed to the economic recovery They include some improvement in the quality of growth[1] and the efficiency of resource allocation, mainly as a result of the dynamic performance of the private sector and the internal structural transformation of the agricultural, forestry and fishery sector through diversification and shifts from low-value staple food stuffs to cash crops, livestock and aquaculture. Other major factors were increased investment; and acceleration of international economic integration.

But the economy's competitiveness remains low compared with other countries in the region. The pace of reforms in the SOE and banking sector was slow to such an extent that it impeded improvement in the business climate in general. Vietnam has been facing difficulties in international trade as the prices of major export commodities, such as rice, coffee, black pepper, cashew nut, rubber, and tea, have dropped since 2000,[2] while prices of agricultural inputs rose.

The post-crisis growth may not be sustained unless a new wave of deeper reforms is introduced. The reform program should include the following key components[3]:

- Institutional reforms, which comprise reform of the legal framework and public administration, and the strengthening of people's participation;

[1] Improvement of quality of growth is reflected in increasing contribution of total factor productivity in 2000 and 2001 which accounts for more than 30 percent of GDP compared to the average level of 20 percent during the 1997-99 period (CIEM 2002).

[2] Rice prices have fallen by over 40 percent since 1998, robusta coffee (which in 2000 accounted for 99 percent of Vietnam's coffee production) traded at only a third of its 1998 price. See World Bank (2001) and CIEM (2002) for more details.

[3] Source: Le Dang Doanh.(2002).

- Improvement of macroeconomic policies in conjunction with trade liberalisation and the gradual opening of capital account;
- Structural reforms including reform of the SOE sector, the banking system, and trade. Measures to promote private sector development and attract FDI are also essential parts of the structural reforms;
- Agricultural development and poverty reduction in rural areas. The focus should be on strengthening the farmers' rights to land use, expanding their choices relating to diversification of production, reducing the risks associated with agricultural product markets, ensuring the food security at household level, providing basic services and developing rural industries;
- Reform of the education and training system and science and technology.

These reform measures would create a stable and favourable environment to conduct business and enhance human capital, which together would lead to more businesses coming into operation, accompanied by growth, employment and income expansion.

2.2. Trend in Poverty Reduction

Poverty definition and its measurement

Poverty is a multi-dimensional concept which extends beyond material deprivation. It is now generally agreed that the dimensions of poverty include not only income-based variables, but also capabilities – such as nutrition, health, education, vulnerability, voicelessness and powerlessness (World Bank 2000). Such a view of poverty, which explicitly recognises the interaction and causal relationship among these dimensions, broadens the scope of poverty analysis and extends the range of policy measures that may be considered for reducing poverty.

This study adopts this broad definition of poverty. However, the focus of the quantitative analysis will be on income poverty (material deprivation) and other indicators of human development, which are more readily quantifiable.

There are currently two approaches to the measurement of income/expenditure poverty in Vietnam. The first, used by the GSO (with World Bank technical assistance, hence sometimes referred to as the World Bank poverty line); and the other is that calculated by MOLISA (often referred to as the official or national poverty line). The GSO calculates two poverty lines for Vietnam: a food poverty line and a general poverty line. The food poverty line is calculated as expenditures required, given Vietnamese food consumption patterns, to deliver 2100 calories per person per day. This is based upon the minimum individual requirement of calories that would ensure good nutritional status. The general poverty line is based upon the food poverty line, but it allows for the inclusion of a minimum quantum of non-food expenditure. These measures are absolute poverty lines and are taken as constant in real terms over time. The basket of goods used to calculate the poverty lines is not varied, with adjustments made only to the prices used to estimate the expenditure required to purchase that basket.

GSO estimates the rate of poverty using nationally representative household surveys (the Vietnam Living Standards Survey (VLSS))[4] that have been conducted twice: in 1992-93 and

[4] The 1993 and 1998 Living Standards Surveys were conducted by the General Statistical Office with funding from Swedish International Development Agency and United Nation Development Programme, and technical assistance from the World Bank. These nationally representative sample surveys provide data on a wide range of

in 1997-98. The poverty lines (in 1998 prices) estimated for the 1998 VLSS are: (i) a food poverty line of VND 1,286,833 per person per year; and (ii) a general poverty line of VND 1,789,871 per person per year. The GSO approach is commonly referred to as the international poverty line, since it is based upon an internationally accepted methodology.

The poverty lines that have been used by MOLISA are more in the nature of relative poverty lines. The level tends to be influenced by the amount of resources that MOLISA has available for special assistance programmes for the poor. From time to time, MOLISA revises the national poverty line. The current MOLISA (national) poverty line adopted since 2001 is: VND 80,000 per month in rural mountainous and island regions (VND 960,000 per year); VND 100,000 per month in the rural plains areas (VND 1.2 million per year); and VND 150,000 per month in urban areas (VND 1.8 million per year). The MOLISA poverty line is often lower than the GSO general poverty line (Centre for International Economics 2002).

The poverty approach used in this study is that of the GSO. It has the following advantages: it takes into account both food and non-food expenditure norms; it does not change in real terms over time, and it permits cross-country comparison. The discussion in this section largely draws on the *Vietnam Development Report 2000* (Poverty Working Group 1999), a comprehensive analytical work on the critical issues in attacking poverty in the years to come.

Overall Poverty Reduction Progress

Vietnam has made substantial progress in poverty reduction over the 1990s. Figure 2 indicates that there has been a sharp fall in both rural and urban poverty in the post-reform period, for both the GSO poverty measures used. The general poverty proportion declined from over 70 percent at the end of 1980s to 58 percent in 1993 and 37 percent in 1998 (Poverty Working Group 1999). During the period 1993-98, the proportion of the food-poor fell from 25 percent to 15 percent. The number of households categorised as generally poor has further declined, although more slowly, from 37 percent in 1998 to 32 percent in 2000 (World Bank 2001).[5] Except for China and Indonesia in the 1980s, almost no other country in recent years has recorded such a sharp decline in poverty.

Available studies suggest that the decline in poverty in Vietnam reflects rising household per capita expenditures and GDP per capita due to an increase in real income during the 1990s. According to the VLSS the average household per capita expenditure rose by 41 percent between 1993 and 1998, indicating a considerable improvement in living standards. During this period the average annual growth in GDP was about 7.2 percent, which was much faster than the average annual growth in population of 1.6 percent, implying thereby a 5.6 percent annual growth in per capita income in aggregate. Table 2 demonstrates that Vietnam's GDP per capita increased considerably from US$ 98 in 1990 to US$ 404 in 2000 in current price or about 1.7 times in real terms.

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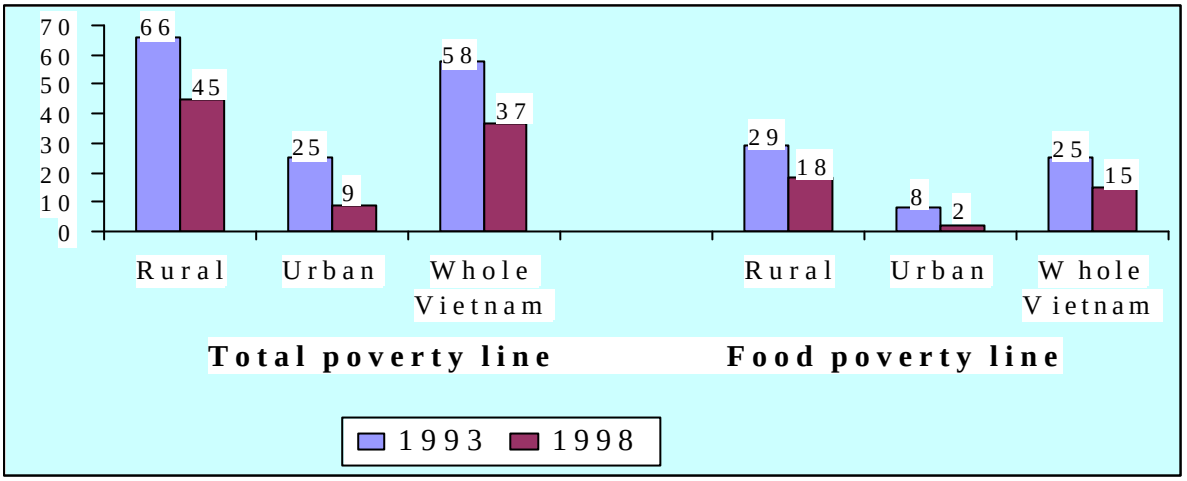
topics, including: expenditures and incomes; education; health, fertility and nutrition; employment; migration; housing; agricultural activities; small household businesses, credit and savings. In addition to the household questionnaires, the surveys also included commune questionnaires (for rural areas only), price questionnaires and, for 1998, modules on school and health facilities. Some 4,800 households were included in the first VLSS and about 6,000 households were covered in the most recent survey. Approximately, 4,300 households were included in both the first and second survey, providing a large panel of household data useful for analysing how living standards have changed over time.

[5] VLSS 2001-02 (GSO 2002) gave preliminary finding that in this period the poverty rate was 32.5 percent.

Figure 2: Incidence of Poverty in Vietnam, 1993 and 1998 (percentage)



***Source**: Adapted from Poverty Working Group (1999).*

Table 2: GDP per Capita of Vietnam

	1990	*1991*	*1992*	*1993*	*1994*	*1995*	*1996*	*1997*	*1998*	*1999*	*2000*	*90-00*
Value (US$)												
Nominal GDP per capita	98	119	145	190	228	289	337	364	354	375	404	
Real GDP per capita in PPP	1046	1086	1158	1228	1313	1414	1521	1619	1695	1741	na	
Growth (percentage)												
Nominal GDP per capita	4.7	21.4	21.8	31.0	20.0	26.8	16.6	8.0	-2.7	5.9	7.7	15.2
Real GDP per capita in PPP	na	3.8	6.6	6.0	6.9	7.7	7.6	6.4	4.7	2.7	na	5.8

***Source**: GSO (2001).*

Poverty Reduction by Region, 1993 and 1998

Poverty has declined in all seven regions of Vietnam, but at different rates. While the incidence of poverty fell by 34 percentage points in the Red River Delta (from 63 to 29 percent), it decreased by only 10 percentage points in the Mekong Delta (from 47 to 37 percent) (Table 3). The proportion of the population living under the poverty line now varies from 8 percent in the South East to 59 percent in the Northern Uplands.

The three regions with the highest poverty rates in 1993 and 1998 were the Northern Uplands, the North Central and the Central Highlands regions. The North Central has seen the greatest reduction in poverty and the Northern Uplands, the least. Table 3 reveals that poverty is also more severe in these three regions. The persistence of the high levels of poverty and its severity in the Northern Uplands and Central Highlands reflects the many constraints which these regions face in participating in the growth process. These include the difficult terrain which limits agricultural development and hinders access to infrastructure, and the low level of human capital. As the rates of poverty reduction among the regions have been unequal, this would have contributed to growing income disparity over the 1990s. When the economic reforms began to take effect, poorer regions, usually the mountainous and remote ones, generally gained less from growth than richer regions.

Table 3: Poverty in Vietnam by Region, 1993 and 1998 (percentage)

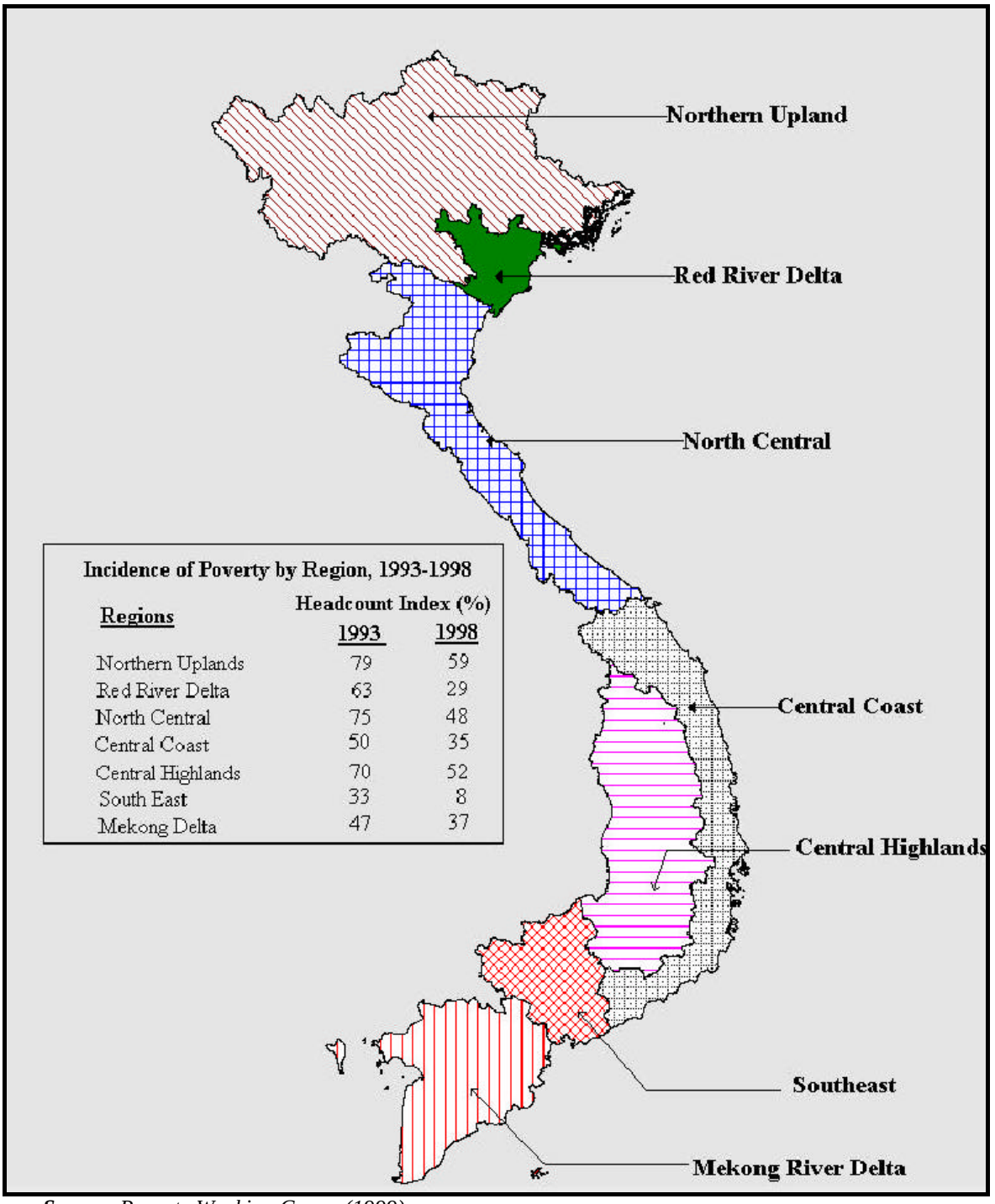
Region	*Share of population in 1998*	*Contribution to total poverty*		*Head count index (poverty line)*		*Poverty gap index*		*Poverty gap squared index*	
		1993	*1998*	*1993*	*1998*	*1993*	*1998*	*1993*	*1998*
By urban-region									
Rural	78	90	90	66	45	21	12	9	4
Urban	22	10	10	25	9	6	2	2	0.5
By region									
Northern Uplands	18	21	28	79	59	27	17	12	6
Red River Delta	20	23	15	63	29	19	6	7	2
North Central	14	16	18	75	48	25	12	11	4
Central Coast	11	10	10	50	35	17	11	8	5
Central Highlands	4	4	5	70	52	26	19	14	10
South East	13	7	3	33	8	9	1	4	0
Mekong Delta	21	18	21	47	37	14	8	6	3
All Vietnam	**100**	**100**	**100**	**58**	**37**	**19**	**10**	**8**	**4**

***Source**: Poverty Working Group (1999).*

Poverty Reduction by Other Dimensions

Table 3 also shows that all the poverty indicators were significantly higher for rural areas and poverty reduction was slower than in cities (Figures 2 and 4). Poverty is highly concentrated in rural areas: 90 percent of the poor live in rural areas, and 45 percent of the rural population live below the poverty line. Rural poverty is strongly associated with farming households, as rural industries are relatively unimportant in Vietnam. As Table 4 demonstrates, the poorest workers in the economy are farmers, who account for 79 percent of the poor in Vietnam in 1998. The table also shows that poverty, as well as the depth and severity of poverty among the working population in all sectors declined substantially over the period 1993-98.

Figure 3: Incidence of Poverty by Regions, 1993 and 1998

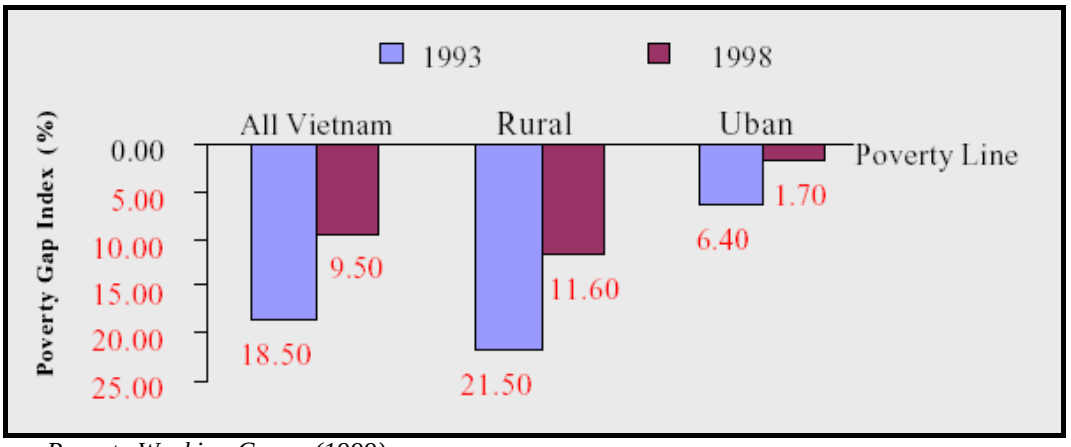


Incidence of Poverty by Region, 1993-1998

Regions	Headcount Index (%)	
	1993	1998
Northern Uplands	79	59
Red River Delta	63	29
North Central	75	48
Central Coast	50	35
Central Highlands	70	52
South East	33	8
Mekong Delta	47	37

***Source**: Poverty Working Group (1999).*

Figure 4: Poverty Gap Index by Rural – Urban Areas



***Source**: Poverty Working Group (1999).*

Table 4: Changes in poverty indexes, 1993-98

	Head count index		***Poverty Gap index***		***Squared poverty gap index***	
	1992-93	***1997-98***	***1992-93***	***1997-98***	***1992-93***	***1997-98***
Self-employed farmer	66.4	47	19.7	12.3	8.3	4.7
Hired farm worker	67.6	55.4	22.9	14.9	10.2	5.5
Self-employed production	39.5	21	13.7	4.2	5.3	1.3
Hired production worker	36.4	20.6	12.8	4.4	4.9	1.4
Sales, hotel and restaurants	24.2	11.2	8.9	1.8	3.3	0.5
Government, party and social organizations	21.0	9.1	6.1	1.7	2.2	0.5
Other services	30.1	15.4	10.7	3.4	4.2	1.2
Vietnam overall	**53.3**	**34.6**	**16.6**	**8.7**	**6.8**	**3.2**

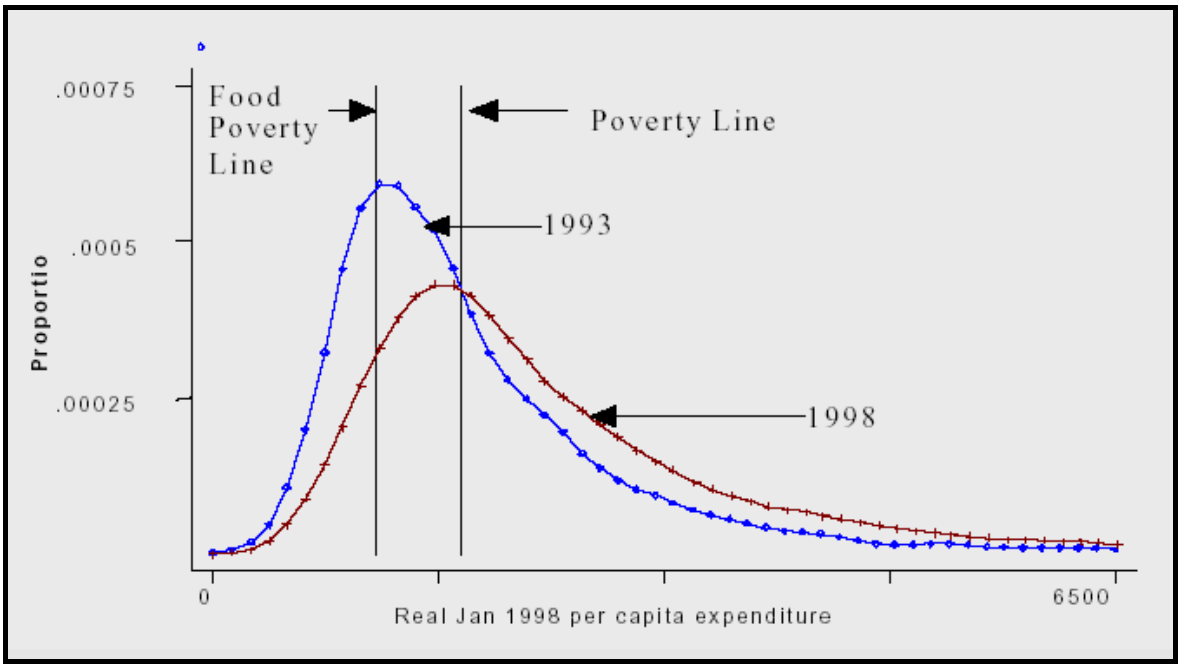
***Source**: Bales et al (2001).*

Poverty in Vietnam also has an ethnic dimension. There are 54 ethnic groups in Vietnam, of whom the Kinh ethnic group, primarily living in lowlands, comprises about 85 percent of the population and constitutes the dominant ethnic group. The remaining ethnic groups are ethnic minorities and most of them, except the Chinese, reside in uplands. Ethnic minorities had substantially higher poverty rates and witnessed much smaller reductions, from 86 percent to 75 percent, while for the rest of the population, the rate fell from 54 percent to 31 percent. While economic gains were wide-spread, they barely reached the remote areas where the ethnic minorities are concentrated, and consequently ethnic people are beginning to lag behind. In 1993, they constituted 20 percent of the poor, but by 1998, the figure had risen to 29 percent. (Poverty Working Group 1999, Poverty Task Force 2002b).

Last, but not least, these impressive achievements in poverty reduction in Vietnam over the period 1990-98 remain fragile. As Figure 5 shows, in 1993 a large proportion of the population was just below the poverty line. Even a small increase in their income would have lifted them out of poverty. In 1998, a large proportion of the population remain clustered

closely around the poverty line. These households are very vulnerable as any shock which reduces income slightly could push many households back into poverty.

Figure 5: Distribution of Expenditure per Capita, 1992-93 and 1997-98



***Source**: Poverty Working Group (1999).*

2.3. Human Development Indicators

Several of the key social dimensions of poverty also show an improvement during the 1990s. Access to public health centres, clean water, electricity and roads has substantially improved between 1993 and 1998, indicating that the poor have benefited from the economic reforms (Table 5). Improved access to health services and clean water has improved the life expectancy at birth and the adult literacy rate. By 2000, Vietnam has achieved universal primary education.[6] Already high primary school enrolment rates have further improved between 1993 and 1998. Lower secondary enrolment rates have doubled for both girls and boys. The number of children enrolled in lower secondary school dipped to a low level of 2.7 million in 1990, but this figure has now climbed to 5 million.?Upper secondary enrolment rates have increased dramatically for both girls and boys, having risen from 6 to 27 percent for girls and from 8 to 30 percent for boys. About 1.6 million children were enrolled in upper secondary school in 1998, reversing the downturn in enrolments seen in the late 1980's and early 1990's (Poverty Working Group 1999).

[6] According to current standards, universal primary education is achieved in a province if 80% (70%) of the 14-year-olds in 90% (80%) of its communes for provinces in the lowland areas (mountainous areas) have completed primary education.

Table 5: Access to Infrastructure in Vietnam, 1993 and 1998

Indicator	*1993*	*1998*
% of rural population with access to public health centre within the community	93	97
% of rural population with access to clean water*	17	29
% of urban population with access to clean water*	60	75
% of population using electricity as a main source of lighting	48	77

***Note**:* Clean water is defined to include piped water, deep wells with pumps and rainwater.*
***Source**: Poverty Working Group (1999).*

Child malnutrition also declined dramatically from about half the population to a third between 1993 and 1998. The under-five child mortality rate fell from 81 percent to 42 per thousand, and the maternal mortality rate declined from 110 to 100 per 100,000 live infants over the last ten years (Socialist Republic of Vietnam (SRV) 2002). Life expectancy increased from 63.4 years in 1992 to 68 years in 2000. These indicators are high even by the standards of countries in the region which have with much higher per capita income levels. Vietnam's Human Development Index (HDI) has shown a remarkable improvement since the early 1990s, rising from 0.611 in 1992 to 0.682 in 1999 (Table 7).

Studies conducted by Action Aid Vietnam (1999), Mountain Rural Development Program (1999), Oxfam Great Britain (1999) and Save the Children UK (1999), reveal that poor households in Vietnam feel more confident about their livelihoods in recent years. With the introduction of market-oriented reforms, the poor are able to obtain higher prices for goods and services they supply, leading to an improvement in their living standards. They have reported reduced stress and fewer domestic and community disputes as life was getting better and easier. The gains from reforms appear to have been widespread as all regions and groups have experienced a fall in poverty, although at different rates.

Table 6: Social Indicators, 1993-98 (percentage)

Indicator	*1993*	*1998*
Education		
Primary enrolment rate (net)		
Female	87.1	90.7
Male	86.3	92.1
Lower secondary enrolment rate (net)*		
Female	29.0	62.1
Male	31.2	61.3
Upper secondary enrolment rate (net)*		
Female	6.1	27.4
Male	8.4	30.0
Child Nutrition		
Incidence of Stunting Among Children 0-59 Months	51	34
Female	51	33
Male	50	35
Adult Nutrition		
Incidence of moderate and severe malnutrition in adults (Body mass index less than 18.5)	32	28
Female (non pregnant)	32	30
Male	32	25

***Source**: Poverty Working Group (1999).*

Table 7: Vietnam's Human Development Index 1992-99

Year	*1992*	*1993*	*1994*	*1995*	*1997*	*1998*	*1999*
Life expectancy at birth (years)	65.2	65.5	66.0	66.4	67.4	67.8	67.8
Adult literacy (%)	91.9	92.5	93	93.7	91.9	92.9	93.1
Combined enrolment rate (%)	49	51	55	55	62	63	67
HDI (value)	0.611	0.618	0.634	0.639	0.666	0.671	0.682
HDI (rank)	120	121	121	122	110	108	101

***Source**: National Centre for Social Sciences and Humanities (NCSSH) (2001).*

2.4. Linkage between Growth and Poverty

Vietnam was a very poor country in 1980s, but subsequently growth has been high and broad-based, and poverty reduction has been widespread and substantial. Since Vietnam is a capital- and land-scarce country, the growth has impacted upon poverty reduction mainly through employment creation, and changes in income levels have come from the more efficient use of existing factors. Among the different types of main employment, non-farm self-employment grew most rapidly during the period 1993-98 (Table 8), with a much higher growth in rural areas than in urban areas. Wage employment grew well, but in contrast with non-farm self-employment, growth in cities was higher than in the countryside.

Table 8: Employment Growth Rates by Type of Main Employment, 1993-98 (percentage)

	Farm self-employment	*Non-farm self-employment*	*Wage employment*	*Total employment*
All Vietnam	**0.4**	**5.4**	**3.5**	**1.8**
By rural-urban				
Rural	0.8	6.7	3.3	1.7
Urban	-8.7	3.9	3.7	2.0
By gender				
Male	-0.3	8.3	4.6	2.1
Female	0.9	3.2	2.0	1.5

***Source**: Poverty Working Group (1999).*

Although the average annual rural farm self-employment growth rate was not large (0.8 percent), the living standards of rural households improved substantially between 1993-98 due to agricultural productivity improvement coming from intensification and diversification away from low-value outputs (staple crops) to higher ones (livestock, aquaculture, perennial crops and fruits) and high export orientation of the sector. Whilst real revenues from rice cultivation increased by 21.2 percent over this period, that from livestock and aquaculture rose by 52.3 percent, from other food crops by 55.0 percent, industrial crops by 65.6 percent, fruit trees by 112.3 percent, and perennial crops by 127.1 percent (Poverty Working Group 1999). This confirms that the agricultural reform and the 1993 Land Law had a crucial impact on patterns of agricultural production, and points to the importance of crop diversification in increasing rural living standards.

The reforms opened the economy to the world, raised the relative prices of agricultural products relative to both agricultural inputs and other non-agricultural prices and improved efficiency. While fertiliser price increased only less than 1.2 times, and even dropped for

NPK, producer crop price almost doubled, especially for non-rice crops over the period 1993-98 (Benjamin and Brandt 2001).[7] Most households in Vietnam are rural and net sellers of agricultural products. They benefited substantially from this rise. Favourable agricultural terms of trade at the time Vietnam opened up the economy further reinforced the gains. Between 1992 and 1998, Vietnam's rice export price increased on average by 9.2 percent per year in nominal terms.[8] It has been estimated that almost half of this increase was due to realignment of the exchange rate, a fifth due to increases in international rice prices and the remainder due to improved marketing efficiency and quality (Poverty Working Group 1999). Most rural households had land and knowledge to respond to the improved price incentives. As a result, agricultural export earnings rose by 14.3 percent per annum over 1990-98, more than fourfold from USD 1 billion in 1990 to USD 4.3 billion in 2000 (General Statistical Office 2000, SRV 2002). Consequently, rural agricultural income grew by over 60 percent between 1993 and 1998.

In turn, higher household income generated in agriculture created increasing demands for goods and services which were met by the private sector, thereby boosting the growth of non-farm jobs. In addition, agro-processing businesses which were established to serve large-scale agricultural production areas, raised value added, created additional jobs and raised the income of the rural poor. Production activities in traditional craft villages have been restored to respond to the policy encouraging private sector development. The rural economy shifted from subsistence production to commercial production to meet domestic and export demands, and at the same time household income rose significantly. All these activities resulted in the growth of rural non-farm self-employment by 6.7 percent compared to the increase in rural income from this source of 30.5 percent. This must have contributed to poverty reduction.

Major increases in income in the cities came from non-farm self-employment and wage employment, mostly in the private sector. As the two VLSSs show, during 1993-98 overall under-employment[9] was less severe, decreasing from 66 percent of total employees to 57 percent. Unemployment also declined from 3.7 percent to 2.2 percent. SOE redundant workers could find jobs relatively easy in the private sector, which was growing rapidly in response to strengthened property rights, a changing attitude toward it and a more supportive environment.

Furthermore, higher real income growth relative to employment growth means that the major source of poverty reduction came from substantial improvement in real income. Indeed, overall declines in poverty are associated with declining poverty rates within each sector, rather than from shifts in employment from low-wage sectors such as agriculture to high-wage ones. An empirical study by Bales *et al* (2001) suggests that over 90 percent of the reduction in poverty occurred because earnings rose within each sector, with the largest gains (55-60 percent) of the poverty reduction accounted for by improvement in income within the agricultural sector. The inter-sectoral employment shift accounts for only 6.0 to 8.8 percent of the reduction of poverty.

Rapid growth and increasing export earnings raised government revenues which were spent more on infrastructure, education and health. All these services are essential for the poor in creating economic opportunities, improving their capacities and reducing their vulnerability to poverty. During the 1990s, the road network was improved considerably and a large number

[7] Haughton (2001) estimated that between 1993 and 1998 the price of rice rose by 62 percent, while the price of non-food items increased by just 23 percent. The price of other food items rose even faster than the price of rice, so that food prices increased by 68 percent overall.

[8] Derived from GSO (various years).

[9] Underemployment here is defined as working less than 40 hours per week.

of modern bridges were built to replace old ones. Many ferry landings and wharves have been upgraded and expanded to meet increased demand over the last few years. Post and telecommunication services also have expanded rapidly and the domestic telecommunication network has been modernised. In 2000, 89.4 percent of communes had access to electricity, 94.6 percent of communes were accessible by car, 98.9 percent of communes had primary schools, and 99.0% of them had a health centre (GSO 2002).

Another factor that may have contributed to impressive poverty reduction outcomes in Vietnam is that poverty reduction has been always among the highest priorities of the government. Along with its reform policies to sustain high economic growth, the government has provided special financial resources for a national programme for hunger eradication and poverty reduction (HEPR), which has been implemented since 1998, although it dates back to the very first initiative taken by Ho Chi Minh City in 1992. The government also launched a number of nation-wide HERP-related measures such as the program on "Re-greening of barren hills, wasted land and sedentarisation of nomadic ethnic minorities", and the programme for "Employment Generation". A separate programme to support the poorest mountainous and remote communes has been launched since 1998 despite budget constraints. Between 1992 and 2000, the government made a total investment of approximately VND 21,000 billion for poverty reduction related measures. The Bank for the Poor was established to provide concessional credit to the poor with the total amount of funds lent to out reaching VND 5,500 billion. In addition, the government has provided considerable support to programmes for ethnic minorities, fixed cultivation, sedentarisation and resettlement. Local people have contributed to infrastructure development projects mainly in kind by providing construction materials and their labour, valued at VND 150 billion. Line ministries and agencies, mass and social organisations, provinces and large cities also have raised funds and sent their staff to assist the poorest communes (State Committee for Ethnic Minorities and Mountainous Areas Affairs, 2001).

Vietnam's poverty reduction campaign has received strong support from many nations, international organisations and non-governmental organisations in various ways (experience sharing, technical assistance, development funds) under the framework of grant aid and concessional credit. This has helped to speed up the pace of poverty reduction in Vietnam.

However, the pace of poverty reduction has slowed since 1998.[10] This may be due to several factors:

- In the early 1990s, as Vietnam was a very poor country, rapid and broad-based growth could lift many people out of poverty. Now the phase of easy gains in poverty reduction is probably over, and Vietnam would have greater difficulty in reducing its poverty rate substantially in future, even if economic growth continues to be high (Haughton 2001).
- As there is an element of fragility in the gains in poverty reduction, the price fall between 1999 and 2001 for major agricultural products that Vietnam exported to the world (rice, coffee, rubber, cashew nuts, and pepper) reduced the income of farmers and pushed many of them back into poverty. The index of domestic prices of non-food relative to that of food also reversed its trend, turning against farmers. It dropped to 98.77 percent between December 1997 and December 2001 compared with 102.5 percent for the period 1992-97.[11]

[10] The changes in poverty reduction in Vietnam are very similar to those in China, which embarked on economic reforms ten years earlier than Vietnam. The economic reforms and rapid growth in China led to a rapid fall in poverty in the 1980s, followed by a period when poverty hardly fell any further (Haughton 2001).
[11] CIEM estimate.

- The lower economic growth as a consequence of the regional crisis and new problems arising during the first round of the reforms translated into a slowing down in poverty reduction. High and sustainable rates of economic growth are a necessary (but not sufficient) condition for rapid poverty reduction.
- The positive impacts of the agricultural reforms in particular and the economic reforms in general in early 1990s are now exhausted, and agriculture is reaching its limits under current circumstances. Constraints that the sector faces include low productivity, difficulties in marketing its products, falling prices of the agricultural products that Vietnam exports to the world, and the acute shortage of cultivable land which limits the number of full-time jobs that can be created in agriculture. The underemployment prevailing in agriculture and a slow shift in employment from agriculture to manufacturing and services has its roots in the government's industrial policy.[12]
- The poor in early 1990s that have escaped from poverty are those who had the capacity to take advantage of opportunities that the reforms created. The people who remained poor are those that are harder to reach, even if rapid economic growth were to continue. Some of them are people with low human capital, who do not have enough knowledge and health to earn good income. Many of the hard-to-reach poor live in uplands and remote areas where infrastructure is poor, so access to market and information is not easy. These include also ethnic minorities who need support that should specifically deal with their problems such as language barriers and low literacy, limited opportunities to acquire new functional and technical skills, lack of access to the mass media and low level of interaction with outsiders. Such groups within the poor often face physical and social isolation, remoteness, powerlessness and vulnerability. The government has adopted a range of targeted policy measures to reach these groups of the poor, but the measures have had a negligible impact so far due to low spending, low coverage and poor targeting (van de Walle 2001).

2.5. Concluding Remarks

Rapid and sustained economic growth over most of the 1990s, as a result of the comprehensive reform package implemented in the late 1980s, has brought remarkable progress in poverty reduction. Between the mid 1980s and 1998 Vietnam's poverty rate has been reduced by half. Major channels through which the benefits of growth reached the poor include improvement in real earnings and income of workers thanks to agricultural reform in rural areas and changes in the attitude towards the private sector that raise demand for products that the poor can supply. However, there still exist disparities poverty reduction between rural and urban areas, among regions, sectors of employment and ethnic groups. The economic slowdown, and consequently the decline in the rate of poverty reduction in late 1990s indicates that new emerging problems and weaknesses of the economy that calls for another wave of reforms.

Chapter 3 attempts to examine in more detail one of major channels through which the benefits of growth reach the poor. This channel goes from growth to employment creation, and via productivity to income improvement.

[12] For detailed discussion, see Chapter 3.

3. INTERLINKAGES BETWEEN ECONOMIC GROWTH, EMPLOYMENT AND POVERTY

3.1. Employment Intensity of Growth

A measure relating employment growth with economic growth is the employment elasticity of output growth. It is measured as the proportionate change in employment divided by the proportionate change in GDP during a given period. A higher employment elasticity means a higher rate of growth of employment for a given increase in output. The employment elasticity should, however, be interpreted with caution. It is possible to have "excessive employment creation that is at the expense of growth of productivity" (Islam 2002). Thus, elasticities greater than unity imply declining labour productivity, and an elasticity of less than unity means that employment expansion is taking place alongside an increase in productivity.

Despite some qualifications of this measure, it is still worth examining the trend in employment elasticity with respect to output growth. One important reason is that from the perspective of poverty analysis, while the growth of output an important concern, it is also important to determine whether output growth creates employment.

There have been no studies, until now, of nexus between output growth and employment growth in Vietnam. Belser (1999), while trying to analyse impact of output growth on employment growth in various ownership sectors estimated the arc employment elasticity of growth for the industry sector between 1993 and 1998. This single coefficient does not adequately determine whether a sector is experiencing a rising or falling productivity over time, and does not accurately measure how much employment growth is associated with a particular level of output growth over time. This section attempts to fill this gap by conducting elasticity estimation and examining its level as well as changes over time.

Theoretical Framework and Data

There are two methods for the estimation of the employment elasticity of growth:

(i) A simple method measures the arc elasticity, i.e. the elasticity is computed between two different points in time, rather than at a point in time. Thus, arc elasticity e is:

$$e = \frac{\Delta L / L}{\Delta Y / Y} \qquad (1)$$

where L stands for employment, while Y denotes GDP. The numerator is the proportionate change in employment, or the employment growth rate; while the denominator is the proportionate change in GDP, that is the growth rate of GDP.

(ii) Econometric estimation of a double-log linear equation relating employment and GDP.

$$\ln L = b_0 + b_1 \ln Y \qquad (2)$$

where ln stands for the natural logarithm of the relevant variable. The regression coefficient b_1 is the employment elasticity:

$$b_1 = \frac{d \ln L}{d \ln Y} = \frac{dL / L}{dY / Y}$$

For estimation of the employment elasticity, time-series data are compiled using various published and unpublished data provided by GSO and MOLISA.

It should be noted that classification of economic activities in Vietnam is different from that in other countries. Particularly, the primary sector (often referred to in Vietnam as agricultural sector) includes agriculture, forestry and fisheries; the secondary sector (industrial sector) consists of mining and quarrying, manufacturing, electricity, gas, water supply and construction, and the tertiary sector (service sector) covers the remaining industries.

Employment Elasticity during 1986-2001

Based upon the relationships defined in the previous sub-section, employment elasticities for the period 1986-2001 were estimated. Estimates of the annual arc employment elasticities of GDP growth by the simple method for the whole economy are shown in Table 9 and Figure 6, and their econometric estimation for the whole economy as well as by sector is presented in Table 10. The elasticity estimates by both methods are consistent and very similar, although arc elasticities are somewhat higher for the periods 1987-91 and 1998-2001. Generally, the overall employment elasticities for Vietnam during the 1986-2001 period are relatively low (just around 0.26 to 0.37) when compared with those for other Asian countries.

Table 9: GDP and Employment Annual Growth Rates (%) and Arc Elasticity, 1987-2001

Annual growth rate (%)

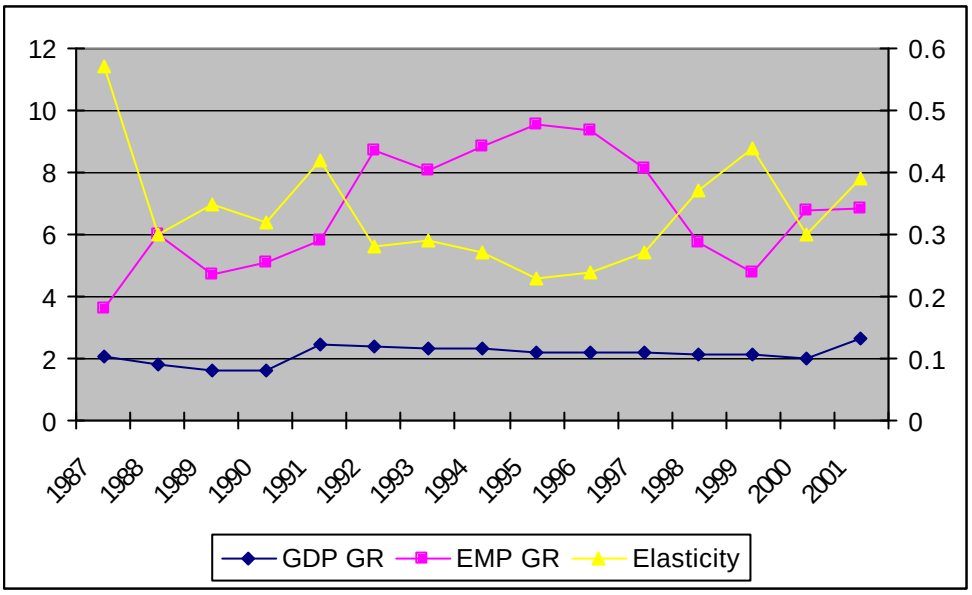
	1987	**1988**	**1989**	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**
GDP Gr.	3.63	6.01	4.68	5.09	5.81	8.70	8.08	8.83	9.54	9.34	8.15	5.76	4.77	6.79	6.84
EMP Gr.	2.08	1.82	1.63	1.63	2.46	2.39	2.34	2.35	2.19	2.21	2.17	2.14	2.11	2.02	2.66
Elasticity	0.57	0.30	0.35	0.32	0.42	0.28	0.29	0.27	0.23	0.24	0.27	0.37	0.44	0.30	0.39

Average annual growth rate (%)

	1987-1991	**1992-1997**	**1998-2001**
GDP Gr.	5.05	8.77	6.04
EMP Gr.	1.92	2.28	2.23
Elasticity	0.39	0.26	0.38

***Source**: GSO data and calculations by the authors.*

Figure 6: GDP and Employment Annual Growth Rates (%) and Arc Elasticities, 1987-2001



Note: *The right-hand side scale is for elasticity. The left-hand side scale is for the GDP growth rate and the employment growth rate.*
Source: *GSO (various years), MOLISA (1996-2001) and calculations by the authors.*

Table 10: Employment Elasticity Using Econometric Method (1986-2001)

	1986-1991	1992-1997	1998-2001	1986-2001
Total economy	0.369	0.260	0.366	0.305
Agricultural sector	0.533	0.394	-0.177	0.374
Industrial sector	-0.590	0.229	0.944	0.180
- Manufacturing	na	0.294	0.790	0.371[a]
Services sector	0.820	0.500	1.910	0.710

Note: *[a]/ For the period of 1990-2001.*
Source: *GSO data and estimation by the authors (see appendix 2).*

It can be seen from Figure 5 that the employment elasticity fluctuates a great deal: it is relatively high value during the sub-period 1987-91; more or less stable and low between 1992 and 1997, and varies greatly and is relatively high again for the sub-period of 1998-2001. As annual employment growth rates for the whole period 1987-2001 do not fluctuate much (they range between 1.63 percent and 2.66 percent),[13] this movement is principally caused by considerable variations in annual GDP growth rates, which are moderate for the first and last sub-period (5.05 percent and 6.04 percent respectively), and high between 1992 and 1997 (8.77 percent). It appears that the employment elasticity and GDP growth move in opposite directions.

The differences in employment elasticity of GDP growth among the three sub-periods correspond to different stages in reforms in the economy, which are discussed below.

[13] It should be noted that employment data in Vietnam in late 1980s and early 1990s might disguise some distinction between employment and underemployment, with the latter probably being reduced gradually during this period. On the other hand, in respond to the SOE reform measures introduced since 1989, SOE employment decreased significantly. This situation led to overall decelerating employment growth rates, but improving labour productivity.

The sub-period of adjustment 1986-91

The period before 1989 was the one of partial (micro and financial) reforms to respond to depletion of the economy. The major objectives of these reforms included creation of new incentives in the agriculture and SOE sector to produce more output, stabilisation and revitalisation of the economy. However, as the reforms were undertaken within the framework of a centrally planned economy, without addressing the fundamental problems of resource misallocation and macroeconomic imbalances, after some initial positive outcomes resulting from better utilisation of existing resources, GDP growth was modest again. The sub-period 1987-91, which was one of the fluctuating and high employment elasticity, may be seen as an episode when the impacts of the partial reforms were fully realised.

During this sub-period, the employment elasticity of GDP growth was high but declining, implying that the economy was relatively labour-intensive but was becoming less so. However, growth during this sub-period appears to have been marked by greater efficiency compared to the period before 1987. Workers who were employed had to work harder and utilise their time well, and, as a result, their productivity was higher. On the other hand, there were those without jobs as a result of the reforms.

Due to the lion's share of agriculture in total employment (about 73 percent) and its large share to GDP (about 32 percent at 1994 prices) in this sub-period, the overall employment elasticity is greatly influenced by the employment elasticity of the agricultural sector. The high employment elasticity of the sector in this period (0.553) reflects, on one hand, its high labour intensity, which is very encouraging, but on the other hand it may reflect other forces at work. A more detailed examination suggests that the agricultural sector during this period was very labour intensive and did not generate high value added compared with the other two sectors. Agriculture, despite the serious constraint on the availability of cultivable land, had been forced to accommodate rural youth who had not been able to find jobs in sectors outside agriculture, as well as workers retrenched due to SOE reform. This resulted in higher rural underemployment (around 60 percent to 70 percent) and lower productivity in agriculture than in the other two sectors. Agriculture has always been the sector with the lowest growth rate averaging at 2.5 percent for the period 1986-91. Sluggish growth of agriculture combined with a large number of agricultural workers made the sectoral employment elasticity relatively high. However, because of its low growth rates, the high labour intensity of the sector did not lead to a large increase in employment.

The estimated employment elasticity for the industrial sector during this period has a minus sign, which was probably caused by the negative output growth rate of the sector in 1989 (-2.6 percent) alongside the still positive (although negligible) growth in employment. The sector underwent a difficult phase with low growth rates, which averaged 4.2 percent for this sub-period. In fact, the sector also did not perform well in terms of employment, which decreased by 7 percent in centrally SOE, by 16 percent in provincial SOEs, and by 28 percent in private enterprises. This sharp drop was caused by several reasons. First, some enterprises lost state-budget subsidies and became inefficient. Secondly, others found access to credit more restrictive. Thirdly, as a result of a reduction in market distortions, the structure of relative prices changed dramatically and the profitability of many firms was affected. Finally, the contraction also resulted partly from the collapse of trading partners in the socialist countries, while new markets were not established (Le Dang Doanh *et al*, 2002).

In the early 1990s, in sharp contrast with agriculture, the service sector was relatively small in terms of employment, but the largest in terms of GDP. However, it grew rapidly, much faster

than the agriculture and the industrial sectors. The employment elasticity of output growth in the service sector was high, with rapid expansion of the sector having a strong positive impact on employment. As Table 9 shows, an output growth rate of one percent can create a 0.82 percent growth rate of employment. The service sector was able to absorb (or was forced to absorb, as in the case with agriculture) a significant proportion of redundant workers from the industrial sector. This was fortunate for the economy which was undergoing structural reforms.

The sub-period of high and stable growth 1992-97

Since 1989 Vietnam adopted a radical and comprehensive reform package aimed at stabilising and opening the economy, enhancing freedom of choice for economic units and promoting competition so as to fundamentally change the system of economic management. Implementation of the reform measures had positive impacts on the economy during this sub-period. GDP growth rates were high and stable, averaging 8.77 percent per annum. The industrial sector took the lead in terms of output growth with an average annual growth rate of 13.25 percent and a rising share in overall GDP, while the opposite happened with agriculture. The services sector also grew at high and stable rates, but its share in GDP was almost stable. Taking the three sectors together, it is rather surprising that high growth was not accompanied by significantly higher employment growth rates over this sub-period. The employment growth rate was just 2.3 percent compared with 1.9 percent in the previous sub-period. This situation is mirrored in lower overall as well as sectoral employment elasticity compared with the previous sub-period. Several possible explanations may be put forward.

Labour force in Vietnam was growing at a stable rate of between 2 and 3 percent per annum. Significantly higher GDP growth in this sub-period should have enabled the economy to absorb all the increments to the labour force at the lower level of the employment elasticity. Furthermore, declining employment elasticity also meant productivity improvement, and hence rising income.

However, a closer look at sectoral developments shows that the high growth of the industrial sector was not accompanied by commensurate employment growth because certain selected industries, most of which were state-owned, capital-intensive and import-substituting, were promoted at the cost of the rest of the economy, through investments, subsidies, concessional taxes and high tariffs for their import-competing products. Small and medium scale private enterprises and export-oriented industries, that were often very labour-intensive, could not compete on this uneven playing field and were crowded out by SOEs or import-substituting industries.

The dominance of capital-intensive industries can be seen in the very limited impact of strong industrial output growth (13.4% per annum) on employment (4% per annum) between 1992 and 1997, implying an employment elasticity of under 0.3 for the industry sector (Belser 1999). In sharp contrast, Republic of Korea, Singapore and Taiwan, China during the 1970s and 1980s, and Indonesia in the early 1990s were able to raise manufacturing employment annually at rates close to 80% of their manufacturing output growth rates (Poverty Working Group 1999).

Labour-intensive agriculture experienced the lowest output growth, and its GDP share was declining. This development path is common for many developing countries, but what is notable for Vietnam was the sluggish ”Lewis transition”, i.e. the movement of labour out of agriculture to the other two sectors was too slow, particularly as manufacturing failed to absorb surplus labour. Rural underemployment continued to exist.

The sub-period of post-Asian crisis 1998-2001

The post-Asian crisis period was the time when Vietnam entered into a new stage of development: the potential benefits of the past reforms were nearly exhausted and Vietnam took significant steps towards integrating itself into the regional and world economy. The regional crisis in 1997-98 had had an adverse impact on the Vietnamese economy, especially on FDI flows.

For this sub-period, overall employment elasticity increased from 0.260 of the 1992-98 period to 0.366 of the period of 1998-2001. This was the result of both lower GDP growth (averaged at 6.04 percent) and a slight acceleration in labour reallocation among the three sectors, reducing labour engaged in the agricultural sector and increasing employment in the other two sectors. This is to a large extent attributable to the government policy since 1998 of re-prioritising in favour of agriculture and rural development. In addition, though capital-intensive and import-substituting SOEs still continued, evidence of their failure became more apparent. There was a growing opinion against their protection. A big push for the private sector was made when the Enterprise Law was promulgated in 1999.[14] Only in two years 2000 and 2001, over 35,000 new enterprises were registered with over 600,000 jobs being created. This figure does not include new jobs generated in newly-registered individual business households and those jobs that came from expanding existing enterprises. A striking increase in employment elasticities for industrial and services sectors reflects these changes. The negative sign for the employment elasticity for agriculture was due to an absolute reduction of its work force in 2001.

However, some caution should be exercised in interpreting these elasticities. In the services sector, employment grew more rapidly than output between 1998 and 2001, so the employment elasticity increased substantially and far exceeded unity (1.91), which implies the growth of low-productivity employment. This process of movement has been going on for some time because agricultural productivity and worker incomes are still much lower than in services. In fact, the services sector in Vietnam now appears to serve as a pool of self-employed and casual labour that has moved out of agriculture and cannot be absorbed in the formal sector.

3.2. Employment, Productivity and Poverty

As demonstrated in Table 11, rapid growth has been accompanied by a significant change in the structure of the economy in terms of both GDP and employment, with the share of industry increasing and that of agriculture declining. This reflects a common pattern of development when workers gradually move out of agriculture to industry and services where they can earn more. But the changes in the employment pattern were slower than the changes in GDP structure. Between 1991 and 2001, the share of industry in GDP increased by almost 11 percentage points; in sharp contrast, its share in employment increased by only 3 percentage points. In 2001, the overwhelming majority of the work force (62.77 percent) was still in agriculture, while it produced only 22.40 percent of the GDP. Most of the workers moving out of agriculture were absorbed by service sector. By and large, the shift in the work force followed only one route, from agriculture to services, but not to manufacturing, and therefore it was rather slow.

[14] The Enterprise Law was passed by the National Assembly on June 12, 1999 and came into effect from January 1, 2000.

Table 11: Structural Changes during the Period 1986-2001 (%)

	GDP at 1994 prices				*Employment structure*			
Year	*Total*	*Agriculture*	*Industry*	*Services*	*Total*	*Agriculture*	*Industry*	*Services*
1986	100.00	34.74	26.82	38.44	100.00	72.91	13.87	13.22
1991	100.00	30.74	25.63	43.64	100.00	72.70	11.25	16.05
1992	100.00	30.22	26.59	43.19	100.00	72.40	11.26	16.34
1993	100.00	28.88	27.71	43.41	100.00	72.06	11.28	16.66
1994	100.00	27.43	28.87	43.70	100.00	71.64	11.36	17.00
1995	100.00	26.24	29.94	43.82	100.00	71.25	11.37	17.38
1996	100.00	25.06	31.34	43.60	100.00	70.72	11.52	17.77
1997	100.00	24.17	32.64	43.20	100.00	70.15	11.66	18.20
1998	100.00	23.66	33.43	42.91	100.00	69.55	11.80	18.65
1999	100.00	23.76	34.36	41.88	100.00	68.91	11.95	19.13
2000	100.00	23.28	35.41	41.30	100.00	68.24	12.11	19.65
2001	100.00	22.40	36.57	41.03	100.00	62.77	14.42	22.82

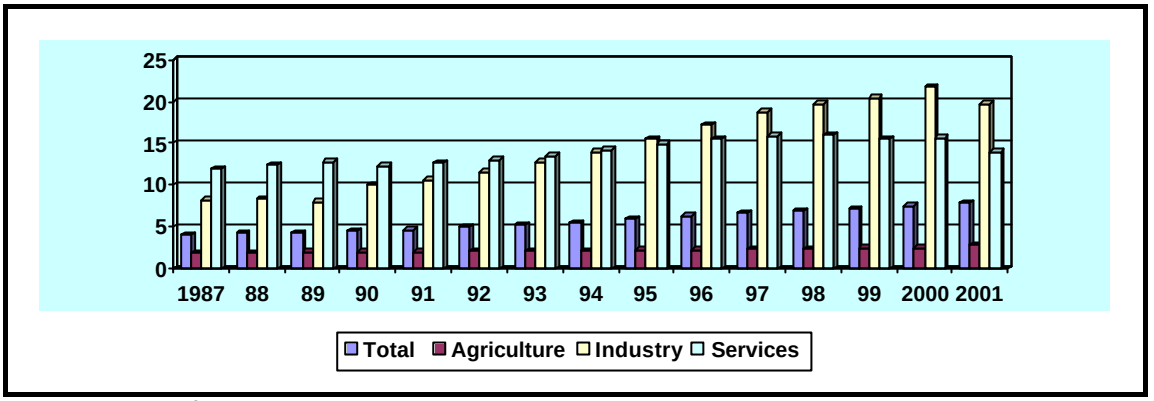
***Source**: Derived from GSO (various years), GSO (2000), and MOLISA data.*

Figure 8 presents sectoral productivity (strictly product per worker) for the period 1987-2001. The figures reveal that:

- Agriculture has the lowest productivity in terms of both growth rate and level, with its productivity level relative to industry declining from one-fourth to one-ninth, and, relative to services, from one-sixth to one-seventh.
- The industrial sector enjoys both the highest productivity growth rates and level, and it surpassed that of services in the second half of the 1990s. Nevertheless, its growth has suffered a sharp slowdown since 1998.
- The services sector experienced steady and high productivity growth rates and levels, but its performance since 1998 was not particularly robust.
- Overall productivity is driven by agricultural productivity, which is also significantly lower than that of the industry and services sectors.
- The gaps between industry and services productivity on one hand, and agricultural productivity on the other, have been widening up to the late 1990s. The situation has since improved (Figure 9) because agriculture has been experiencing higher growth rates while the opposite has happened with industry and services.

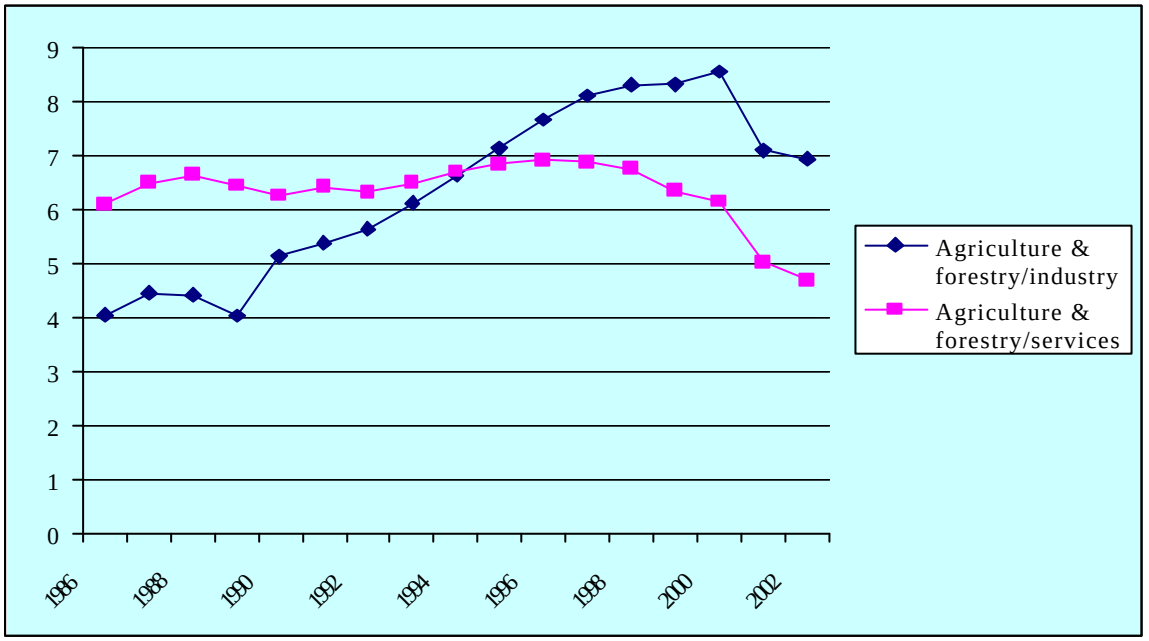
Patterns and levels of sectoral productivities are closely associated with sectoral growth performance and the relative sluggishness in shifts in the sectoral employment structure in relation to the shift in sectoral GDP. Slow growth in agriculture combined with the slow movement of the labour force from agriculture to the other two sectors resulted in both a low level and a low growth rate of agricultural productivity relative to that in the rest of the economy. In its turn, levels and patterns of overall and sectoral growth and employment by and large are driven by the industrial policies that the country adopts. Some explanations for the sectoral patterns of employment and productivity can be found in the government's industrial policies during the 1990s, as well as quality of the labour force, both of which will be discussed in what follows.

Figure 8: Productivity, 1987-2001 (million VND, 1994 prices)



***Source**: Derived from GSO (various years), GSO (2000), and MOLISA data.*

Figure 9: Productivity Gap between Sectors, 1986-2001 (number of times)



***Source**: Derived from GSO (various years), GSO (2000), and MOLISA data.*

Table 12: Employment Growth Rate and Productivity and its Growth Rate

	Employment growth rate (%)				*Productivity growth rate (%,1994 prices)*			
Year	***Total***	***Agriculture***	***Industry***	***Services***	***Total***	***Agriculture***	***Industry***	***Services***
1987	2.08	2.22	1.87	1.55	1.50	-3.30	6.50	3.00
1988	1.82	1.17	3.46	3.75	4.10	2.50	1.50	4.80
1989	1.63	1.15	0.75	5.11	3.00	5.80	-3.30	2.60
1990	1.63	2.78	-18.09	15.47	3.40	-1.70	24.90	-4.60
1991	2.46	2.01	2.56	4.46	3.30	0.20	5.00	2.80
1987-91	*1.92*	*1.87*	*-1.89*	*6.07*	*3.06*	*0.68*	*6.91*	*1.73*
1992	2.39	1.97	2.47	4.26	6.20	4.80	10.10	3.20
1993	2.34	1.86	2.53	4.34	5.60	1.40	9.80	4.10
1994	2.35	1.76	3.11	4.40	6.30	1.60	10.00	5.00
1995	2.19	1.64	2.26	4.49	7.20	3.10	11.10	5.10
1996	2.21	1.44	3.51	4.51	7.00	2.90	10.60	4.10
1997	2.17	1.35	3.42	4.62	5.90	2.90	8.90	2.40
1992-97	*2.27*	*1.67*	*2.88*	*4.44*	*6.35*	*2.79*	*10.04*	*3.98*
1998	2.14	1.27	3.39	4.71	3.50	2.20	4.80	0.40
1999	2.11	1.17	3.45	4.74	2.60	4.00	4.10	-2.40
2000	2.02	1.02	3.37	4.77	4.70	3.60	6.50	0.50
2001	2.66	-5.58	22.19	19.21	4.10	8.90	-9.70	-11.00
1998-2001	*2.23*	*-0.53*	*8.10*	*8.36*	*3.73*	*4.67*	*1.41*	*-3.12*
1987-2001	**2.15**	**1.15**	**2.68**	**6.03**	**4.56**	**2.59**	**6.71**	**1.34**

***Source**: Derived from GSO (various years), GSO (2000), and MOLISA data.*

Productivity is closely associated with qualifications of the labour force, which have experienced some improvement. As Tables 13 and 14 indicate, there has been some improvement over the period 1997-2001 with the change in the composition of the work force away from unskilled workers (unskilled and semi-skilled) toward workers with qualification. But this shift has been small, and by 2001 an overwhelming majority of the employed labour force (84 percent) still had no relevant skills. The number of skilled workers without certificates almost doubled between 1999 and 2001, and there was also a big increase in skilled persons with certificates. Despite a large increase in the number of workers with post-graduate qualifications, this group only forms 0.07 percent of the employed labour force in 2001. Another important issue is whether qualifications and skills on the supply side match demand in the labour market.

Table 13: Qualification of Labour Force, 1997-2001 (percentages)

Year	*Unskilled*	*Semi-skilled*	*Skilled without certificate*	*Skilled with certificate*	*Vocational secondary School*	*College /Uni*	*Master /Doctor*	*Total*
1997	87.75	1.51	2.34	2.05	3.80	2.51	0.05	100.00
1999	86.13	1.52	2.33	2.35	4.22	3.41	0.05	100.00
2001	82.63	1.33	4.67	3.96	3.68	3.67	0.07	100.00

***Data source**: MOLISA (1998, 2000, 2002).*

Table 15 shows that agricultural workers have much lower skill levels and are less educated than workers in manufacturing and services. The lower level of skills and qualifications in agriculture hinders the use of new technology and thereby makes agricultural productivity grow slowly relative to that of manufacturing and services. This has the effect of depressing rural income.

Table 14: Growth Rates of Labour Force by Level of Skills, 1997-2001 (percentages)

	Unskilled	*Semi-skilled*	*Skilled without certificate*	*Skilled with certificate*	*Vocational secondary School*	*College /Uni*	*Master /Doctor*	*Total*
Growth 1997-99	2.21	4.85	3.83	19.74	15.47	41.50	2.62	4.14
Growth 1999-2001	-4.33	-12.26	99.90	67.66	-13.05	7.25	43.82	-0.28

***Data source**: MOLISA (1998, 2000, 2002).*

Table 15: Composition of Labour Skills by Sector, 2001 (percentages)

	Unskilled	*Semi-skilled*	*Skilled without certificate*	*Skilled with certificate*	*Vocational secondary school*	*College /uni*	*Master /doctor*	*Total*
Agriculture	97.10	0.60	0.50	0.45	1.06	0.28	0.00	100.00
Industry	52.84	2.13	21.67	15.79	3.35	4.17	0.05	100.00
Services	61.64	2.85	5.41	6.11	11.07	12.67	0.26	100.00
Total	82.63	1.33	4.67	3.96	3.68	3.67	0.07	100.00

***Data source**: MOLISA (2002).*

Regarding industrial policies, the government appears to be following a combination of import-substitution and export-oriented strategies. Its main objective, however, is the substitution of domestic production for imports of manufactured goods so that the economy can become more self-sufficient. The rationale that appears to support this policy is that due to major weaknesses of the economy in terms of production inefficiencies, technological levels, capital availability and managerial skills, a significant number of domestic businesses cannot compete internationally unless they develop for some time under some degree of protection (the so-called 'infant industry argument'). But protection provided to selected capital-intensive industries draws away scarce resources (capital and skilled labour) from agriculture and labour-intensive manufacturing into capital-intensive industries, leaving the former, especially agriculture, with unskilled labour and little capital. The rapid development of the manufacturing and service sectors was largely concentrated in urban areas due to good infrastructure and availability of skilled labour. The urban bias and heavy focus on large-scale manufacturing projects in the public investment programme before 1998 has contributed substantially to rural backwardness and agricultural under-funding, especially in research and extension. Compared with some other countries in the region such as the Philippines, Thailand and Indonesia. agriculture receives substantially less public expenditure support than it contributes to GDP, Given the relative importance of public expenditure among all agricultural investment sources, this makes it difficult to achieve major advances in agricultural output and productivity which would enable agriculture to catch up with other sectors and restructure its production. "The Vietnam Public Expenditure Review" (UNDP 1996: 10-22) suggested that only public investment in irrigation and water resource management was adequate, public investment in other agriculture-related components were far short of needs.

Further, the state and FDI sectors dominated industry (accounting for 78.1 percent of the total industry output in 1998), but employed relatively fewer workers (35.7 percent of the industrial employees) than the private sector, which is much smaller in terms of the total output, but much more labour-intensive. This suggests that the lack of growth in industrial employment is to a large extent due to the small size of the private sector. The discussion on poverty in the previous chapter suggested that poverty was a rural phenomenon, and that poverty was more prevalent in mountainous and remote areas, where non-farm activities were underdeveloped. This pointed to the need to generate more opportunities for the labour of the rural poor.

On the other hand, it should be noted that although the services sector in Vietnam provides higher income levels for workers compared to agriculture, its capacity to absorb labour is probably reaching its limit under the current industrial policy. That has resulted in an increasing number of new jobs in services at declining productivity since 1998. Although the sector recovered steadily from 2000, services are mainly concentrated in social infrastructure (education and health), domestic retail trade, repairs and other low-value personal services for households and tourists. High value-added services to support the development of highly competitive manufacturing such as financial and banking services, insurance, telecommunication, business consulting service, information technology are underdeveloped. These activities can contribute significantly to the future growth of output, employment and productivity of the sector, provided the right incentives are in place.

3.3. Wages and Salaries

Although real wages and earnings are important channels through which the benefits of rapid output growth and improved productivity are likely to reach the poor, discussion on this issue is limited due to the lack of long time-series data on wages and earnings in Vietnam.

Real wages and earnings appear to be rising. Empirical studies conducted by Hoang Van Kinh *et al* (2001) and Haughton *et al* (2001) found that most of changes in household wealth, among those who could improve their income substantially between 1993 and 1998, were due to increases in earnings per hour worked. The effects of working more, or having a higher proportion of the household working, or receiving more remittances, were comparatively minor. During the period 1991-2002 the growth rate of real income was higher than that between 1996 and 1999 (5.8 percent vs. 4.6 percent per year). As income inequality worsened slightly over the 1990s,[15] the benefits of growth accruing to the poor were probably less than to the rich.

This finding is verified by the real situation in the public sector, when real wages and earnings for employees have been increasing thanks to upward adjustments of the monthly nominal minimum wage between 1997 and 2001.[16] The government has adjusted the monthly minimum wage from VND 144,000 in 1997, to VND 180,000 in 2000, to VND 210,000 in 2001 and VND 240,000 in 2002[17]. As the consumer price index went up by about 80 percent, while the minimum wage rose about 170 percent during this period, the adjustments resulted in an increase in real wages for public servants. It should be borne in mind that because of differences in multipliers, senior staff enjoys a greater improvement of real wages than their juniors. However, looking at the longer period from 1993 up to now, adjustments in the minimum wage seem to have just compensated workers for the overall increase in prices.

For foreign companies and joint ventures, the minimum wage is usually about three or four times higher than that in domestic enterprises. This situation leads to differences in wages and earnings between domestic (including state and private) and foreign enterprises. It has been estimated that the average monthly income of an employee in the state sector and private sector in 2001 were approximately VND 900,000 and VND 375,000 (equivalent to US$ 60

[15] The Gini coefficient for per capita expenditure increased from 0.33 in 1993 to 0.35 in 1998, and Gini for per capita income increased from 0.390 in 1999 to 0.391 in 2001-02. It should be borne in mind that the Gini coefficient for per capita income is always higher than that for consumption expenditure due to differences in savings.

[16] In the public sector this minimum wage is used as a base on which nominal salaries are calculated as a multiplier of the minimum wage. Thus, any increase in the minimum wage automatically leads to an increase in the salaries of all public servants.

[17] From January 2003 the minimum wage is VND 290,000.

and US$ 25) respectively, while his/her counterpart in the foreign-invested sector earned US$ 74 (or VND 1,029,000).[18]

Wage and earning disparities also exist between rural and urban areas. Wage income in rural areas accounted for only 21.9 percent of rural household income in 1993 and the proportion declined to 17.1 percent in 1998 (Poverty Working Group 1999). Given that agricultural wage employment, the dominant type of rural wage employment, declined by 4.7 percent per annum over the period 1993-98, the unchanged level of rural wage income in real terms implied an improvement in rural wages. Nevertheless, this improvement appears to have been smaller than that for urban workers, for over this period per capita expenditure in rural areas increased by 30 percent (or 5.4 percent per annum), while in urban areas it grew twice as fast (61 percent or 9.9 percent per annum).

3.4. Concluding Remarks

Vietnam's achievements in poverty reduction during the period of renovation from 1991 to 2001 were remarkable, but this chapter argues that more impressive outcomes could have been achieved if it had utilised its comparative advantage viz. the abundance of labour. A certain proportion of the poor, particularly those residing in the countryside, mountainous and remote areas, was not able to move out of low-income low-productivity agriculture to manufacturing because the latter was largely urban-based and many of its enterprises were too capital-intensive to generate many jobs as they grew. At the same time, agriculture, constrained by the availability of cultivable land, severely under-funded, burdened with low human capital and inadequate infrastructure, was not able to provide enough jobs and high income for rural people. Rural industry, dominated by labour-intensive small- and medium-scale enterprises was not able to compete on an uneven playing field to provide many employment opportunities.

This chapter finds that at the macro level, declining poverty in Vietnam has been associated with improved real income and earnings in each sector rather than inter-sectoral employment shifts toward high productivity occupations. Striking improvements in productivity in the industry sector between 1992-97 reduced poverty, mainly for existing workers, but did not generate many additional jobs and did not facilitate the employment movement of workers out of agriculture.

The next chapter explores the linkages between economic growth, employment and poverty at the household level to find out why some of the poor were able to get out of poverty, and to identify who they are, and what they do for living. Some attention is also devoted to those who were not able to catch up.

[18] Vietnam Economic Times, Aug 18, 2000.

4. EMPLOYMENT-POVERTY LINKAGES: AN ESTIMATION USING A PROBIT MODEL FOR THE CASE OF VIETNAM

Despite impressive economic growth over most of the past decade, in 1998, 45 percent of the rural population were still below the poverty line, and over one-third of the population was poor even in 2002. How important are factors such as household human capital, employment-related and other variables in explaining the poverty status of households? Identification of the causes of poverty is important for policy-makers seeking to design appropriate policy measures to attack poverty.

There are several studies attempting to explain household levels of wealth or poverty in Vietnam. Using a regression of the logarithm of real per capita consumption of rural households on a vector of household and community characteristics, as well as regional dummy variables, Dollar and Glewwe (1998) found that in addition to regional differences, rural income in 1992-93 was determined by quantity of land farmed, the household head's level of education, and access to infrastructure (irrigation, electricity and passable roads). The study focused on rural income but did not determine factors affecting the poverty status on households.

Wiens (1998) adopted another approach, examining simple correlations between household poverty and each factor that was believed to affect poverty. His study suggested that rural poverty in 1992-93 was associated with the paucity of productive resources (land, savings, and other liquidity assets, and physical capital), their low quality (lack of irrigation, an unfavourable natural environment, lack of education, lack of decent public infrastructure), lack of access to markets (for inputs, credit, outputs and off-farm employment opportunities), and the high number of dependants relative to productive resources. Wiens' study is illuminating in respect of poverty determinants, but his approach has a serious drawback. It is impossible to disentangle the effects of each separate factor in influencing household poverty.

There are two studies that estimate multinomial logistic regression models applying data of two VLSS 1992-93 and 1997-98 to determine poverty-related factors. The first by Glewwe *et al* (2000) investigates the factors that determine movements in and out of poverty by splitting the panel sample into four categories: households that were poor in both years ("remain poor"), households that were poor in 1992-93 but not in 1997-98 ("escape poverty"), households that were not poor in 1992-93 but were in 1997-98 ("fall back into poverty"), and households that were not poor in both years ("never poor"). Their findings are that factors such as better education, favourable location (in urban areas, or in the Red River Delta and the South East region), households headed by a white-collar worker, and improvement in the productivity of rice appear to enable households escape poverty. The study permits tracking of changes in poverty between 1993 and 1998, but does not directly quantify the probability of a household being poor according to different attributes.

Do Thien Kinh *et al* (2001) also apply multinomial logistic regressions to model determinants of poverty/wealth in both years 1992-93 and 1997-98. The major shortcoming of this work is that it omits several variables that are essential for poverty reduction, such as asset-related variables (household income, landholding, and durable assets), variables indicating level of agricultural diversification (perennial crop cultivation, aquaculture), and variables relating to a supporting environment to conduct business (access to credit and to technical information).

The empirical work in this chapter tries to overcome all the weaknesses of the above studies in analysing quantitatively the factors that influence the poor and non-poor status of households in Vietnam. In quantifying the impact of the factors on the household's poor/non-poor status, the study differentiates the effect of income, household characteristics (which somehow are controllable by households), and variables representing environment factors

(which are out of control of households). The study exploits a probit model to ascertain the distinct effect of each of these factors. This chapter conducts test hypotheses relating to the significant role of the factors and the signs of the effect, and interprets the impact of these factors on household poor/non-poor status. The chapter is organised into four parts – model specification, data, results and interpretations, and concluding remarks.

4.1. Model Specification

To conduct empirical study on some economic and social issues dealing with responses of categorical or ordinal data general linear models are often inappropriate because they do not maintain their desirable asymptotic properties when the errors are heteroscedastic, or non-normal. For this reason general linear models often provide misleading answers. For this kind of problem, discrete choice models and limited dependent variable models have proved to be more effective and more suitable for the task of analysis. This study uses a probit model which is among the class of discrete choice models.

As the focus of the analysis is the impact of the determinants on the poverty situation of households it is useful to use a model with a dependent variable that takes only two values representing the poor and the non-poor status of households. Let variable Y denote household poor/non-poor status, if the i^{th} household is among the poor category, then $Y_i = 1$, and if it is not, then $Y_i = 0$. Now let P_i be probability that $Y_i = 1$, that means that the event occurs, and (1 - P_i) is probability that $Y_i = 0$ (the event does not occur).

Define a latent variable Y^* such that:

$$Y^*_i = X_i ß + e \quad (1)$$

Where X is a vector of factors that determines Y

We do not observe Y^*, but rather Y, which takes only two values of 1 and 0 according to the following rule:

$Y_i = 1$ if $Y^*_i > 0$ and

$Y_i = 0$ otherwise

If it is assumed that it is normally distributed with the same mean and variance, it is possible to estimate not only the parameters of Equation (1), but also to get some information about the unobservable Y^*_i itself. This gives rise to a standard probit model: [19]

$$P_i = \text{Prob}(Y_i = 1) = ?(X_i, ß/s) \quad (2)$$

Estimating the probit model is straightforward even though the model is non-linear and no closed-form expression for function $?$ exists.

The probit regression measures the association between probability of being poor/non-poor and a whole range of factors including characteristics of the household, the income and mean of production, and the socio-economic environment (development level of the area where the household lives). The dependent variable of poor/non-poor status is created based upon the poverty line calculated by the Poverty Working Group (1999).[20] The independent variables determining the probability of households being poor/non-poor are discussed in what follows.

[19] See Long (1997), or Johnston and DiNardo (1997), for example.
[20] See Section 2.2 for more details.

A prominent feature of households in Asian developing countries, especially in Vietnam, is the multi-generation extension of households[21]. This means a household in Vietnam often has many generations living in it. Moreover, under the influence of Confucianism, a typical household in Vietnam keeps quite a strict hierarchy. The head of a household as an "old person" often has a final decision in family matters. As the household head plays a crucial role for a business of the household, the demographic characteristics of a household can be represented by characteristics of the household head. In other words, in our analysis, the characteristics of the household head can be good proxies for the characteristics of the household. Such characteristics would inlcude variables of age, education, gender, working sector status.

Age of a household head (this variable is denoted as AGE in the model) can represent experiences of the household. The older the household head, the more experience he/she tends to have, and wider the range of investment opportunities for the household. For farm work and for households involved in agricultural activities, experience seems to be very important because crop cultivation is affected by many factors such as climate conditions, quality of soil, irrigation, and the timing of the harvest. The success of harvests depends greatly on the skills and the art of cultivation. Accumulated experience and knowledge transfers from generation to generation determine these factors. Consequently, households with more experience are more likely to succeed and escape poverty.

The rationale behind the use of the education variable (EDUC) in the models comes from several sources. On one hand, education may affect income according to the concept of Friedman's permanent income. Since education usually plays very important role in assuring a certain life-cycle income, it is argued that education will result in more stable income to individuals and households. Hence, higher education may have a positive effect on the probability of getting out of poverty. On the other hand, if one takes the precautionary motive and liquidity constraints into account, a higher education level raises the household head's ability to assess the economic environment and balance the budget of the family to its best interest. In developing countries, where uncertainty is high and liquidity constraints are severe, education could help an individual or household cope better with various sources of uncertainty of income and constraints upon borrowing, thus raising saving and assets. Therefore, via this channel, the education level may also have a positive impact on reducing the probability of being poor. In both channels, education is conventionally argued as an important input for generating income and creating assets, and improving the poor/non-poor status of the household. In Vietnam, poverty rates tend to decline with higher levels of education, and those with a lower secondary education or below make up almost 90 percent of the poor. The highest incidence of poverty (57 percent) is for those who have not even completed primary education (Poverty Working Group 1999).

In addition, education often has a characteristic of spill-over effect. This means knowledge of a household member attending school or college could be spread and used for the common welfare of the household. It is very likely that household head can be influenced by education of other adult members of the household. For example, education and knowledge of an adult member of a household can help the household head apply better seeds, pesticides and

[21] This study uses the words 'household' and 'family' interchangeably although in fact there are a number of definitions of 'household' and 'family' that distinguish these two concepts. In the literature, a variety of functions are usually associated with the household: co-residence; joint production; shared consumption and kinship links. These functions define different sets of individuals. Given the varied and complex nature of human society, generally, no definition of the household completely fits all circumstances. The definition of the household should be given depending on the particular purpose of research. The household in this research is defined in terms of shared consumption, income and kinship links and, thus, is very close to the family.

fertiliser. As a result, crop yield can be improved, and income of the household can be raised. Because of this characteristic, the study uses an additional variable of education that is defined as an average number of years of schooling of household members who are older than sixteen (denoted AVEREDUC in the model). This is the age at which ideas and knowledge of an individual could be regarded as a help to the household head in decision-making. The variable also can capture the education level of the household head because the household head is supposed to be older than 17 years.

Gender (GENDER) often plays an important role in organising and conducting the business of the family. Quantitative data from both rounds of VLSS show that female-headed households are usually materially better off than their male-headed counterparts. The incidence of poverty as well as its depth are lower in the former than in the latter. This may not be the case in many other developing countries

Whether the household head works in the farm or the non-farm sector may also influence the level of wealth and income stability of households. As discussed in Chapter Two, the incidence of poverty is the highest among farming households, with 79 percent of the poor in Vietnam working in agriculture in 1998. Working in non-farm activities is often thought to result in higher and more stabilised income because, in the farm sector, crops depend greatly on uncontrollable factors such as the weather and natural conditions. Therefore, the working status of a household head (FARM) may also have effect on the probability of poor/non-poor status of the household. Beside the variable FARM, an additional variable that presents non-farm productive activities carried out any member of a household is also used. The reason for using this variable arises from the fact that households often have multi-generational characteristics. Any member of the household who involves in non-farm activities could share the benefits with all other members of the household. As a result, involvement of a household member in non-farm activities may help to reduce the poor status of the household.

Regarding household demographic characteristics, household size (HHSIZE) often matters for family businesses. This is because a larger household size is often related to a greater number of children in the household, creating more financial pressure on household expenditure. Household size also can have a positive effect on household income due to the nature of the economy of scale. These two effects work in opposite directions and the net effect can only be determined by empirical studies. The dependency ratio (DEPRATIO) is also important for the change of the probability of poor/non-poor status of a household. The dependency ratio is very often used in the literature at both macro and micro levels. It is defined in this study as the ratio of the number of children aged less than 15 years and the number of people aged 65 years and over to the total number of the household members. Children of the age under 15 are dependent since most of them are in school. Dependants include people of 65 years and over for the reason that labour force participation drops sharply at that age group to less than 50 percent. The rationale for the use of this variable in the models comes from the fact that the likelihood of household budget deficits will be higher when the number of dependants increases, because dependants deplete household resources rather than create them. Therefore, an increase in the dependency ratio can raise the probability of the household falling in poverty. The VLSS data confirm that the number of children is highest in households in the poorest quintile and drops as per capita expenditure rises (Poverty Working Group 1999).

The poor/non-poor status also depends on a set of factors related to physical assets and income of households. In this study, three variables are used to represent physical assets of a household. The first variable is income (INCOME). The rationale of using this variable is the phenomenon of vicious circle of poverty. A household that is poor, having a low level of income, and often having to borrow, would have less opportunity to invest for future. The productivity of future business, for example, future crops, would be low. In some cases in

Vietnam, poor agricultural households have to sell their crops at low prices, before they harvest, in order to pay back their debts to lenders. As a result, their income is low, and the investment opportunities for the future are limited. A lower income level of a household can therefore result in a rise in probability of being poor. The second variable in the set is land (in fact, in the model, two variables, *per capita irrigated land* – PCIRRLAND – and *per capita land* – PCLAND - are used). These are the important means of production for farming households. The participatory poverty assessments (Action Aid Vietnam 1999, Oxfam Great Britain 1999, Mountain Rural Development Program, 1999) suggest that the quantity and quality of landholdings are critical determinants of well-being. Poor households are often those whose landholdings were either too small or of such poor quality that they cannot support household self-consumption needs and grow cash crops. The third variable is durable assets (DURABLE). This is a proxy for assets of households. A higher value of assets of households can have positive impact on investment opportunities and can result in reducing the probability of being poor.

The set of variables discussed above relate to the financial capacity of households. In this study an additional set of variables, which represents technical capacity of households, is also used. This includes the characteristics of household products and the capacity of households to diversify crops and products. Vietnam's experience suggests that those households which diversify their products can improve production efficiency and hence raise their income. The set of these variables includes a dummy variable for perennial industrial crop (PERINDCROP), which indicates that the household is involved in growing perennial industrial crops; and a dummy variable of aquaculture (AQUACULTURE) which represents households involving in aquaculture activities. It is expected that involvement of households in these activities would reduce the probability of their being poor, because agricultural diversification often brings higher income for households.

As the data set contains information on credit and borrowings, a variable representing access to credit in the formal sector (CREDACC) is also included. The reason for including this variable in the model is the argument that access to formal credit could help households to increase investment and stabilise consumption better, and consequently would help to reduce the probability of being poor. In addition, a variable representing technical support in the form of dissemination of information (INFORSP) for farm households that is provided by state organisations is also included. This kind of support facilitates improvement of productivity and farming household income, and is therefore expected to reduce the probability of being poor.

The importance of location for opportunities to improve income and move out of poverty in Vietnam is highlighted in many reports and studies.[22] This is the justification for the inclusion of dummy variables for regions (REG) and for urban/rural areas (URBAN) where households live. Definitions of the variables used in this model and summary of their statistics are provided in Appendix 3.

4.2. Data

The data for this empirical study are taken from the VLSS conducted by the World Bank, General Statistical Office and the State Planning Committee of Vietnam between 1997 and

[22] See e.g. Poverty Working Group (1999), Haughton (2001), Do Thien Kinh *et al* (2001), Hoang Van Kinh *et al* (2001), Haughton *et al* (2001), Deichmann *et al* (2001), National Centre for Social Sciences and Humanities (2001), Glewwe *et al* (2000), Centre for International Economics (2002).

1998. It is a survey at the household and individual level with a sample of 6,000 households located in all regions of Vietnam.

Due to the sampling procedure, there is a sampling bias. The sample size selected for the 1997-98 VLSS was projected to be 6,000 households. The majority of the sample comprises of the selected households interviewed in 1992-93 during the first VLSS survey (4,800 households). An additional 1,200 households were required to attain a sample size of 6,000. This was done by selecting households from the total sample of the 1995 Multi-Purpose Household Survey (MPHS) of GSO.

In order to provide an adequate sample to disaggregate results into the seven major regions, the selection of the additional households was not proportional to population, but instead was chosen so that the total sample of 6,000 households over-sampled certain specific domains. Therefore, to correct for the bias, weighted data were used for estimation in this study (see more details in Appendix 4).

4.3. Result Estimation and Interpretation

Two probit models were used to estimate the effect of the determining variables on the poor/non-poor status of household. The second model is different from the first model in using the variables of access of any member of household to non-farm activity (NONFARMONE) and average years of schooling of adult members of household (AVEREDUC) instead of the activity (FARM) and education (EDUC) of the household head.

The estimated results of the probit models are presented in Tables 15 and 16. These results were obtained after the problem of heteroscedasticity had been solved. The Pseudo - R^2, that is measures of the overall fitness of the model, shows that both models perform well. In addition to the estimation of the model coefficients, values of derivatives at the mean values (meaning the partial change) of all the variables in the sample were also computed and are given in the tables. The coefficients of this model (Dprobit models, the third columns in Table 4.1 and 4.2) help to explain the effect of a change in the explanatory variables on the probability of outcome and thus measure partial changes or marginal effects in the probabilities. The hypothesis that an explanatory variable has an insignificant effect on the outcome is tested using the z-test. The Z-statistic and, equivalently, P-values show the significant/insignificant level of the estimated coefficient of an independent variable. For a general rule of interpretation of the probit model, a positive (negative) sign of an estimated coefficient in the model shows that higher value of the variable increases (decreases) the likelihood that the event occurs.

In general, the estimated results of the probit models support very well the hypotheses presented in the previous section. Tables 15 and 16 show that, in models 1 and 2 respectively, in terms of the statistically significant level, 14 out of 21 and 15 out of 21 estimated coefficients are significant at the 5 percent level. The signs of the coefficients are as expected. Income (INCOME) and assets (DURABLE) were found to be important to poor/non-poor status. Other things being the same, as income increases, the likelihood that the household is poor would be reduced. An increase in income by one million VND, holding all other variables constant at their mean, would reduce the probability of the household being poor by 10 percentage points. Similarly, the positive coefficient of DURABLE suggests that, as durable assets increase, *ceteris paribus*, the possibility that the household being in the non-poor category is likely to increase. An increase in durable assets by one million VND, holding all other variables constant, would reduce the probability of household being poor by 1

percentage point. These results support well our hypotheses that the set of asset variables can help households improve their life and escape from the vicious circle of poverty.

Table 15: Probit and Dprobit regression results (Model 1)

Variable	Probit coefficients	Marginal effect (dP/dx)	Z	P>| Z |
INCOME	-0.0001	- 0.00001	- 5.69	0.00
DURABLE	-0.0001	- 0.00001	- 4.05	0.00
HHSIZE	0.35	0.05	13.62	0.00
GENDER	- 0.08	- 0.01	- 1.23	0.20
FARM	0.35	0.05	4.53	0.00
URBAN	- 0.72	- 0.08	- 6.81	0.00
AGE	- 0.02	- 0.002	- 6.65	0.00
EDUC	- 0.07	- 0.01	- 7.96	0.00
DEPRATIO	0.63	0.09	5.12	0.00
REG1	0.47	0.08	4.87	0.00
REG2	0.38	0.06	3.94	0.00
REG3	0.26	0.04	2.56	0.01
REG4	-0.04	-0.005	- 0.40	0.69
REG5	0.17	0.03	1.54	0.12
REG6	- 1.01	- 0.09	- 8.27	0.00
CREDACCFM	-0.01	-0.001	-0.14	0.90
PCLAND	0.00003	0.000004	1.40	0.16
PCIRRLAND	-0.0001	- 0.00002	- 3.79	0.00
AQUACULTURE	-0.31	-0.05	-2.66	0.01
PERINDCROP	-0.09	-0.01	-1.52	0.13
INFORSP	-0.09	-0.01	-1.43	0.15
CONST	-0.44		-2.31	0.02
Number of obs.:		4856		
Wald Chi2:		700.72		
Pseudo-R^2:		0.35		

For the set of characteristics of households, household size (HHSIZE) is an important factor determining the poor/non-poor status of a household. The result shows that one unit increase in household size, ceteris paribus, would result in an increase of probability of the household being poor by 5 percent. This result implies that the effect of the household size on poverty via the channel of demographic dependency may be larger than the effect via the channel of economies of scale. In the channel of the demographic dependency, an increase in the number of non-working people (dependants) could increase the expenditure of the household and thus increase the likelihood that the household is poor. In the channel of economies of scale, the per capita cost of living and production activities of households can be reduced by the increase in the number of dependants. The effect via the first channel outweighs the effect via the second channel, making the net effect of the household size on the likelihood of the poor/no-poor status positive. The result of the estimated coefficient of the variable of dependency ratio (DEPRATIO), in fact, confirms this suggestion. An increase by one unit in the dependency ratio, *ceteris paribus*, would result in an increase in the range of 4 to 9 percent in the probability of the household being poor.

The age of the household head (AGE) seems to have a negative effect on the probability that the household is poor. As the household head's age increases by one year, holding all other variables constant, the probability of household being poor is reduced by a range of 0.1 to 0.2 percentage points. The variable of education of the household head was also found to be important. Holding all other variables constant, one year increase in attending school by the household head (EDUC) would result in reducing the probability of the household being poor by 1 percentage point (Model 1). Similarly, a one year increase in the average years of schooling of adult members in the household (AVEREDU) would reduce the likelihood of household being poor by 3 percentage points (Model 2).

Access to non-farm employment is clearly associated with poor/non-poor status of households. Working as the household head in the farm sector (FARM) would increase the probability of a household being poor by 5 percent in comparison with working in the non-farm sector (Model 1). By contrast, the fact that a household has at least one member (NONFARNONE) who is involved in non-farm activity would reduce the probability that the household is poor by 5 percent (Model 2).

While per capita land area (PCLAND) is found to be unimportant, the variable of per capita irrigated land (PCIRRLAND) is found to be positive to reducing probability of poor status of households. The result shows that as the area of per capita irrigated land of a household increases by 1 hectare, *ceteris paribus*, the probability that the household is poor would reduced by 20 percent. This result confirms the argument that a household having more means of production and irrigated land would have more and better opportunities to work and invest and thus have a better chance to reduce poverty.

Table 16: Probit and Dprobit regression results (Model 2)

Variable	Probit coefficients	Marginal effect (dP/dx)	Z	P>| Z |
INCOME	-0.001	- 0.00001	- 6.23	0.00
DURABLE	-0.001	- 0.00001	- 4.36	0.00
HHSIZE	0.38	0.05	16.02	0.00
GENDER	- 0.16	- 0.02	- 2.64	0.01
NONFARMONE	- 0.39	- 0.05	-5.99	0.17
URBAN	- 0.80	- 0.08	-7.88	0.00
AGE	- 0.01	- 0.001	- 2.68	0.01
AVEREDUC	- 0.23	- 0.03	- 7.71	0.00
DEPRATIO	0.32	0.04	2.77	0.01
REG1	0.29	0.04	3.40	0.00
REG2	0.19	0.03	2.12	0.03
REG3	0.12	0.02	1.25	0.21
REG4	0.02	0.003	0.22	0.83
REG5	0.19	0.03	1.79	0.07
REG6	- 1.02	- 0.08	- 8.74	0.00
CREDACC	-0.02	-0.003	-0.42	0.69
PCLAND	0.00003	0.00003	1.40	0.16
PCIRRLAND	-0.0001	- 0.00002	- 4.50	0.00
AQUACULTURE	-0.24	-0.03	-2.31	0.02
PERINDCROP	-0.15	-0.02	-2.53	0.01
INFORSP	-0.11	-0.01	-1.71	0.09
CONST	-0.69		-4.21	0.00
Number of obs.:	5413			
Wald Chi2:	833.34			
Pseudo-R^2:	0.35			

However, as land and irrigated land area are limited, the issue of using techniques to intensify land use is more important. In the models, the variables associated with the technical issues are diversification of crops (such as cultivating perennial crops, raising fish and shrimps) and technical and information support from the government. The coefficient of the dummy variable AQUACULTURE, which represents the households involved in raising fish and shrimp, is found significant at the 5 percent level. As a household involves in aquacultural activities, the probability that the household is poor is reduced by a range from 3 to 5 percent. Similarly, as a household grows perennial industrial crops (PERINDCROP equals 1), the probability of the household being poor is reduced by 2 percent.

The dummy variable INFOSP, which represents households having received information and technical support from the government agencies, was found to be important at the 9 and 15 percent level in Model 2 and Model 1, respectively. This means the evidence of the effect is weaker than that of the other variables. A positive value of the coefficient implies that if a household receives technical and information support from the government agencies, it would reduce the likelihood that the household falls in the category of poor. The variable of access to credit in the formal sector is found to be insignificant even at the 10 percent level. This suggests that the formal credit system for poor people may not function well enough and does not have yet a significant role in poverty alleviation for the poor. The informal sector may be the major source supplying credit for the poor.

The dummy variables of regions (REG) also are found to be important except two regions of the Central Coast and the Central Highlands. This indicates that, apart from the Southeast region, in comparison to the households in the Mekong Delta (the base region) the probability of households being poor in other regions seems to be higher. This result seems reasonable since the Southeast and Mekong Delta are the two most developed regions of the country. The significance level of the coefficient of the dummy variable of areas (URBAN) suggests that there are differences between urban and rural areas. The negative sign of the coefficient of this variable shows that a household living in urban areas would have a lower likelihood of being poor than the household in rural areas. This result confirms the higher opportunity of improving life conditions for people in urban areas and is supported by the evidence of widening of the urban-rural income gap.

4.4. Concluding Remarks

The results of this empirical study support the argument that the poor/non-poor status of a household can be affected by many factors. The study confirms importance of factors such as non-farm income and income, assets, the demographic characteristics of households (such as household size, age, education level, and dependency ratio), agricultural diversification, the availability of irrigated land, technical and information support from the government agencies, and location. Among these factors, the most influential appear to be multiple sources of household income from farm and non-farm activities, household size and dependency ratio, education, household location and technical and information support from the government.

5. POLICY IMPLICATIONS AND CONCLUSIONS

Rapid and sustained growth in Vietnam over most of the 1990s has resulted in notable achievements in poverty reduction. Vietnam's experience over the 1990s suggests that market-oriented reforms and economic integration, by and large, do not hurt the poor; instead it helps them by increasing the demand for the goods and services that they sell. The broad-based rapid growth brought by the reforms has in fact increased opportunities for the poor. Since Vietnam is a poor country with abundant labour but scarcity of land and capital, growth accompanied by intensive use of labour is the key to achieving the goal of poverty reduction.

The implementation of major government policies, especially industrial policies, has resulted in a relatively slow shift in the employment structure, when compared with the GDP structure. It has also resulted in disparities in levels of development between regions, and differentials in sectoral productivities. Agriculture has suffered from low productivity as well as sluggish growth relative to the other sectors. As most of the poor are farmers, the performance of agriculture has to some extent constrained progress in poverty reduction. Also, during the past decade, major improvements in household income came from increases in earnings per hour worked within each sector rather than from the movement of labour out of low-productivity sectors (e.g. agriculture) to ones with higher productivity. This was probably due to the relatively highly capital-intensive nature of the latter. Where structural shifts in employment did occur, for instance, to services in the recent past, productivity in services declined as the sector's capacity to absorb labour without loss of productivity was limited. These structural features are reflected in wide variations in the pace of poverty reduction between rural and urban areas, and among regions, sectors and occupations. The period of the easy gains in poverty reduction in Vietnam appears to be over, It will be much more difficult for government policies and programmes to have an impact on those among the poor who live in the countryside, mountainous and remote areas, who have low levels of endowments or who belong to ethnic minorities with their specific ways of life, culture, language and customs. It is also important to stress that the achievements in poverty reduction in Vietnam remain fragile for a large proportion of the population remains clustered around the poverty line and continue to be highly vulnerable.

A key point emerging from this study is the essential role of employment expansion and high productivity for rapid and sustainable poverty reduction. Every pro-poor policy, directly or indirectly, seeks to create employment opportunities for the poor or improve productivity on a sustainable basis, especially in the sector employing the poor. Both elements raise the incomes of the poor and hence speed up the pace of poverty reduction. Policies for poverty reduction therefore should focus on two issues: accelerating the shift in employment from agriculture to higher-productivity sectors; and further improving productivity in all sectors with special focus on agriculture, which employs most of the poor.

Two broad groups of pro-poor policies to deal with these issues may be distinguished: policies at the macro level, and those at the household level.

5.1. Macro-Level Policies

This study argues that a necessary requirement for poverty reduction is high and sustainable economic growth. Vietnam's experience before the Asian crisis shows that high growth could benefit many of the poor directly or indirectly through improved productivity and a higher level of employment creation. However, a high level of growth is not sufficient. The pattern of growth is also an important factor in accelerating the pace of poverty reduction. The high

incidence of poverty in rural areas points to the need for the government to review its industrial policy and accord greater priority to rural development.

At the macro level, the pace of poverty reduction is determined crucially by the way structure of the economy shifts over time and this, in turn, depends on government industrial policies. Over the period 1993-98, rural living standards in Vietnam improved, driven predominantly by a diversification of on-farm activity as a strong response to the agricultural reforms. However, in the future, Vietnam may not be able to replicate this land-based, agricultural diversification success story, which is now reaching its limits (Poverty Working Group 1999). Growth in the medium term will probably come from the establishment of labour-intensive industries to generate rural off-farm employment for semi-skilled and unskilled labour. Given these realities, to promote growth and poverty reduction in rural areas, policies should promote intensive investment in agriculture to improve land productivity, by diversification of agricultural production away from rice towards high value crops, livestock and aquaculture, and through intensifying agricultural research and development, and the dissemination of research results through agricultural extension. Expanding domestic markets are essential for agriculture, which in the past has been exporting a large part of its output of certain products to other countries. A more radical way to improve rural income is through the generation of supplementary off-farm employment, particularly if rural-urban migration is not viewed as a good alternative.

In urban areas, living standards have risen faster than in rural areas, but the opportunities provided by economic growth have been less evenly distributed. The state industrial sector has grown rapidly, but created relatively few jobs as it continues to be dominated by capital-intensive enterprises. The urban unemployment problem has to be tackled. Further reform of SOEs is required so as to address the problem of SOE inefficiency. There is a need to abolish all explicit and implicit subsidies and protection that have created overwhelming advantages for SOEs and have crowded out investment in the private sector. Incentives for the expansion of labour-intensive industries and the private sector development should be provided. The Enterprise Law serves as a good example of this kind of incentive to promote a dynamic private sector, which would provide significant opportunities for employment creation in the years to come.

The process of structural change in employment will continue, with further shifts in the future from agriculture towards manufacturing and services sectors. Therefore the ability of the economy to maintain its impressive record of achievements in poverty reduction would depend critically on what happens to wages and earnings in the services sector. For the time being, this sector is very labour-intensive, providing low value-added services that do not create much income. The sector should move towards high-value services that support manufacturing, and it should grow faster and become more competitive. Services which have great scope include financial and banking services, information technology, telecommunication, legal advice services, insurance, telecommunication and consulting services. They could generate many jobs and generate high incomes, but this would require that the relevant training is provided.

5.2. Household-Level Policies

At the household level, past experience shows and this is confirmed by this empirical study, that some of the poor were able to escape poverty because they utilised their labour and took full advantage of the opportunities created by the reforms. These were people who had labour, land, and economic assets; they could borrow to invest in their farm and non-farm businesses, and, they had the education and knowledge required to be able to respond to market demands.

They lived in areas with good infrastructure and developed non-farm activities; they had access to information about markets and new techniques, and, they were very close, or had a convenient access, to markets to buy and sell products.

But not all the poor could benefit in this way. Many were constrained by their low human capital (poor health, limited education and knowledge), large numbers of dependants (children, elderly or disabled family members), limited endowment of land, capital and assets, and the remoteness of their location. Government pro-poor policies directed at the household level therefore should aim to improve capability of the poor, to create a productive environment for them to do business and provide safety nets for those who are not capable of taking advantages of opportunities created for them, or who suffer from unexpected substantial falls in income due to natural disasters or loss of jobs. The most important policies required, which would have an impact at the household level include:

(i) Policies to enhance the human capital of the poor through providing basic services such as health care, clean water, education, training and retraining, and technology transfer through agricultural extension activities so that the poor have knowledge, intellectual and physical capability to take up opportunities created by the economic reforms. As VLSS 1997-98 demonstrates, people with a lower secondary education or below make up almost 90 percent of the poor in Vietnam. The highest incidence of poverty (57 percent) is for those who have not completed primary education (Poverty Working Group 1999: 21). Education and training to acquire necessary skills, and general and functional knowledge usually provide good opportunities of securing stable jobs, and understanding and applying new techniques. Education also helps households take advantage of other infrastructure services such as irrigation, communication, electricity and transport. In China, spending on education helped to bring the greatest number of people out of poverty (Fan, Zhang and Zhang, forthcoming). Better health care will improve health status of the poor, which in its turn will reduce the costs incurred by illness and diminish the risk of loss of earnings.

(ii) Policies to improve physical infrastructure such as electricity, road, irrigation, communication can contribute to increasing the access of the poor to markets. Physical isolation caused by remoteness and poor infrastructure reduces economic opportunities, and makes access to markets, basic social services, credit, information and mass media more difficult. Poor infrastructure creates major obstacles for agricultural diversification and results in the underdevelopment of off-farm activities. Adequate irrigation services have in the past contributed substantially to productivity improvement of rice and other crops and enabled more rapid rotation of crops and harvests from 1.3 up to 2-2.7 harvests during the year (Poverty Task Force 2002a). Good infrastructure is also crucial for improving the welfare of the poor in many other economic and social aspects, such as nutrition, health, literacy, political and social exclusion, and vulnerability. An empirical study by Fan, Hazell and Thorat (2000) suggests that the Indian government's expenditure on road construction contributed more to poverty reduction than did the other investments.

(iii) Policies to promote research and development, especially in agriculture, can significantly raise productivity. Returns to investment in agricultural research are very high world-wide, and its impact on poverty reduction is substantial. Fan, Hazell and Thorat (2000) and Fan, Zhang and Zhang (forthcoming) show that agricultural research and development expenditures ranked second in both countries (after road construction and education in India and China respectively), in terms of poverty reduction through greater agricultural yields which generated higher income for farmers, declines in food prices for consumers, and improved wages in non-farm activities.

(iv) So far, only a small number of private businesses have access to formal credit due to complicated administrative formalities and other implicit barriers. If investment opportunities are forgone due to capital shortage, all other investments and policies to create a favourable environment for businesses and improving human capital for the poor will not be successful. Policies are therefore needed which facilitate easy access to credit for doing business, especially for the poor, and this will require further reform of the banking sector.

(v) In Vietnam, where a large proportion of households is clustered around the poverty line, protection from external shocks is essential for poverty reduction. An important need is to establish safety nets including social protection for the disabled, retrenchment payments, and emergency relief. Vietnam's new round of reforms, together with the further growth and reduction in poverty that is expected, will lead to structural changes in the economy. Some sectors will expand and some will contract. Some people in the declining sectors may lose their jobs or sources of income and fall back below the poverty line. SOE and trade policy reforms are the most likely set of measures which would have direct implications for the level of poverty in Vietnam. SOE reforms are likely to have an adverse impact upon employment. The adverse effects of the lay-offs that may be expected will have to be mitigated by a well-designed safety net that provides funding for re-training and severance pay. Retraining and an ability to quickly relocate to fast-growing areas will assist displaced workers to take advantage of opportunities that may be generated by the reform program. The magnitude of the adverse effects of lay-offs will ultimately depend crucially upon the establishment of safety nets and quality and relevance in relation to needs of the training and re-training provided. In a disaster-prone country like Vietnam, social safety nets can also help the poor to tide over disasters.

A special targeted programme for ethnic minority development is needed to help upland people and ethnic minorities to escape from poverty. People belonging to ethnic minorities often face not only physical, but also social, isolation from the world outside their community. This isolation is associated to a significant extent with their linguistic, cultural and educational differences as well as differences in cultivation practices. These impede their interaction with the civilised world, and limit their access to new information, improved techniques and ideas. Again, the regional dimension should be accorded greater importance in both macro- and household-level policies. There is a trade-off in resource allocation between areas with the highest financial returns and those with the greatest needs. Evidence from many countries suggests that resource allocation under pro-poor policies should be directed more towards poorer regions with greater needs, rather than serving to reinforce current regional disparities.

Last but not least, implementation of different policies in isolation from one another is not enough. An integrated package of interventions embodying complementary policies is desirable in order to reap greater benefits from available resources. The comprehensive Poverty Reduction Growth Strategy (Socialist Republic of Vietnam 2002) and Vietnam's development goals (see Appendix 1) reflect the government's determination to adopt an integrated approach towards the poor. But these policy measures will succeed only if there is a massive effort and close coordination on all fronts among all stakeholders.

APPENDIXES

Appendix 1: Vietnam Development Goals

Vietnam Development Goals Directly Based on the Millennium Development Goals

Goal 1: Reduce the percentage of poor and hungry households

***Target 1*:** Reduce by 40 percent the proportion of people living below the international poverty line between 2001 and 2010

***Target 2*:** Reduce by 75 percent the number of people living under the international food poverty line by 2010

Goal 2: Universalise education and improve education quality

***Target 1*:** Increase net enrolment in primary school to 97 percent by 2005 and to 99 percent by 2010

***Target 2*:** Increase the net enrolment rate in junior secondary school to 80 percent by 2005 and 90 percent by 2010

***Target 3*:** Eliminate the gender gap in primary and secondary education by 2005, and the gap for ethnic minorities by 2010

***Target 4*:** Increase literacy to 95 percent for under-40-year-old women by 2005 and 100 percent by 2010

***Target 5*:** By 2010 improve the quality of education and increase full-day schooling at primary level (exact target depends on funding)

Goal 3: Ensure gender equality and women empowerment

***Target 1*:** Increase the number of women in elective bodies at all levels

***Target 2*:** Increase the participation of women in agencies and sectors [includes ministries, central agencies and enterprises] at all levels by 3-5 percent in the next 10 years

***Target 3*:** Ensure that the names of both husband and wife appears on the land-use right certificates by 2005

***Target 4*:** Reduce the vulnerability of women to domestic violence

Goal 4: Reduce child mortality, child malnutrition and reduce the birth rate

***Target 1*:** Reduce the infant mortality rate to 30 per 1000 live births by 2005 and 25 by 2010 and at a more rapid rate in disadvantaged regions (see below)

***Target 2*:** Reduce the under-5 mortality rate to 36 per 1000 live births by 2005 and 32 by 2010

***Target 3*:** Reduce under-5 malnutrition to 25 percent by 2005 and 20 percent by 2010

Goal 5: Improve maternal health

***Target 1*:** Reduce the maternal mortality rate to 80 per 100,000 live births by 2005 and 70 by 2010 with particular attention to disadvantaged areas

Goal 6: Reduce HIV/AIDS infection and eradicate other major diseases

***Target 1*:** Slow the increase in the spread of HIV/AIDs by 2005 and halve the rate of increase by 2010

Goal 7: Ensure environmental sustainability

***Target 1*:** Extend forest cover to 43 percent by 2010 (from 33 percent in 1999)

***Target 2*:** Ensure that 60 percent of the rural population has access to clean and safe water by 2005 and 85 percent by 2010. Access to clean and safe water should be provided for 80 percent of urban people by 2005.

***Target 3*:** Ensure there are no slums and temporary houses in all towns and cities by 2010

***Target 4*:** Ensure that all waste-water in towns and cities is treated by 2010

***Target 5*:** Ensure that all solid waste is collected and disposed of safely in all towns and cities by 2010

***Target 6*:** Air and water pollution must attain national standards by 2005

Vietnam Development Goals and Targets,* not *directly based on MDGs

Goal 8: Reducing vulnerability

***Target 1*:** By 2005, increase the average income of the lowest expenditure quintile to 140 percent of that in 2000 and to 190 percent of that by 2010

***Target 2*:** Reduce by half the rate of poor people falling back into poverty due to natural disasters and other risks by 2010

Goal 9: Improving governance for poverty reduction

***Target 1*:** Effectively implement grass-roots democracy

***Target 2*:** Ensure budget transparency

***Target 3*:** Implement legal reform agenda

Goal 10: Reducing ethnic inequality

***Target 1*:** Preserve and develop the reading and writing ability of ethnic languages

***Target 2*:** Ensure entitlement of individual and collective land-use rights in ethnic minority and mountainous areas

***Target 3*:** Increase the proportion of ethnic minority people in authority bodies at various levels

Goal 11: Ensuring pro-poor infrastructure development

***Target 1*:** Provide basic infrastructure to 80 percent of poor communes by 2005 and 100 percent by 2010

***Target 2*:** Expand the national transmission grid to 900 poor commune centres by 2005

Appendix 2: Estimation Result of Employment Elasticity

Dependent Variable: LOG(LABOUR)
Method: Least Squares
Sample: 1986 1991
Included observations: 6

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	5.936079	0.166543	35.64286	0.0000
LOG(GDP)	0.369408	0.014212	25.99299	0.0000
R-squared	0.994114	Mean dependent var		10.26492
Adjusted R-squared	0.992643	S.D. dependent var		0.034449
S.E. of regression	0.002955	Akaike info criterion		-8.549574
Sum squared resid	3.49E-05	Schwarz criterion		-8.618987
Log likelihood	27.64872	F-statistic		675.6356
Durbin-Watson stat	2.418689	Prob(F-statistic)		0.000013

Dependent Variable: LOG(LABOUR)
Method: Least Squares
Sample: 1992 1997
Included observations: 6

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	7.234078	0.056313	128.4623	0.0000
LOG(GDP)	0.260262	0.004638	56.11060	0.0000
R-squared	0.998731	Mean dependent var		10.39360
Adjusted R-squared	0.998414	S.D. dependent var		0.041661
S.E. of regression	0.001659	Akaike info criterion		-9.703771
Sum squared resid	1.10E-05	Schwarz criterion		-9.773184
Log likelihood	31.11131	F-statistic		3148.400
Durbin-Watson stat	1.547993	Prob(F-statistic)		0.000001

Dependent Variable: LOG(LABOUR)
Method: Least Squares
Sample: 1998 2001
Included observations: 4

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	5.921554	0.212879	27.81651	0.0013
LOG(GDP)	0.366673	0.017041	21.51662	0.0022
R-squared	0.995699	Mean dependent var		10.50193
Adjusted R-squared	0.993548	S.D. dependent var		0.028600
S.E. of regression	0.002297	Akaike info criterion		-9.007326
Sum squared resid	1.06E-05	Schwarz criterion		-9.314179
Log likelihood	20.01465	F-statistic		462.9650
Durbin-Watson stat	3.301299	Prob(F-statistic)		0.002153

Dependent Variable: LOG(LABOUR)
Method: Least Squares
Sample: 1986 2001
Included observations: 16

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	6.690165	0.059291	112.8363	0.0000
LOG(GDP)	0.305083	0.004911	62.12729	0.0000
R-squared	0.996386	Mean dependent var		10.37243
Adjusted R-squared	0.996128	S.D. dependent var		0.102039
S.E. of regression	0.006350	Akaike info criterion		-7.164404
Sum squared resid	0.000564	Schwarz criterion		-7.067830
Log likelihood	59.31523	F-statistic		3859.800
Durbin-Watson stat	0.583611	Prob(F-statistic)		0.000000

Dependent Variable: LOG(L_AGR)

Method: Least Squares
Sample: 1986 1991
Included observations: 6

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4.291333	1.253048	3.424714	0.0267
LOG(GDP_AGR)	0.533574	0.118226	4.513161	0.0107

R-squared	0.835854	Mean dependent var	9.946473
Adjusted R-squared	0.794818	S.D. dependent var	0.033677
S.E. of regression	0.015255	Akaike info criterion	-5.266664
Sum squared resid	0.000931	Schwarz criterion	-5.336078
Log likelihood	17.79999	F-statistic	20.36862
Durbin-Watson stat	2.162407	Prob(F-statistic)	0.010714

Dependent Variable: LOG(L_AGR)
Method: Least Squares
Sample: 1992 1997
Included observations: 6

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	5.780972	0.267980	21.57238	0.0000
LOG(GDP_AGR)	0.394858	0.024750	15.95400	0.0001

R-squared	0.984528	Mean dependent var	10.05624
Adjusted R-squared	0.980660	S.D. dependent var	0.029945
S.E. of regression	0.004164	Akaike info criterion	-7.863253
Sum squared resid	6.94E-05	Schwarz criterion	-7.932667
Log likelihood	25.58976	F-statistic	254.5303
Durbin-Watson stat	1.082583	Prob(F-statistic)	0.000090

Dependent Variable: LOG(L_AGR)
Method: Least Squares
Sample: 1998 2001
Included observations: 4

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	12.06315	3.318456	3.635168	0.0680
LOG(GDP_AGR)	-0.177372	0.300754	-0.589757	0.6151

R-squared	0.148143	Mean dependent var	10.10608
Adjusted R-squared	-0.277785	S.D. dependent var	0.025012
S.E. of regression	0.028273	Akaike info criterion	-3.986970
Sum squared resid	0.001599	Schwarz criterion	-4.293823
Log likelihood	9.973941	F-statistic	0.347813
Durbin-Watson stat	2.200414	Prob(F-statistic)	0.615106

Dependent Variable: LOG(L_AGR)
Method: Least Squares
Sample: 1986 2001
Included observations: 16

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	5.983542	0.361966	16.53067	0.0000
LOG(GDP_AGR)	0.374681	0.033532	11.17387	0.0000

R-squared	0.899176	Mean dependent var	10.02754
Adjusted R-squared	0.891974	S.D. dependent var	0.073522
S.E. of regression	0.024165	Akaike info criterion	-4.491384
Sum squared resid	0.008175	Schwarz criterion	-4.394810
Log likelihood	37.93107	F-statistic	124.8553
Durbin-Watson stat	0.780440	Prob(F-statistic)	0.000000

Dependent Variable: LOG(L_IND)

Method: Least Squares
Sample: 1986 1991
Included observations: 6

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	14.35654	6.017262	2.385893	0.0755
LOG(GDP_IND)	-0.590279	0.579034	-1.019419	0.3656

R-squared	0.206226	Mean dependent var	8.222531
Adjusted R-squared	0.007782	S.D. dependent var	0.085725
S.E. of regression	0.085391	Akaike info criterion	-1.821944
Sum squared resid	0.029167	Schwarz criterion	-1.891357
Log likelihood	7.465832	F-statistic	1.039216
Durbin-Watson stat	1.641678	Prob(F-statistic)	0.365644

Dependent Variable: LOG(L_IND)
Method: Least Squares
Sample: 1992 1997
Included observations: 6

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	5.713943	0.079354	72.00588	0.0000
LOG(GDP_IND)	0.229799	0.007267	31.62047	0.0000

R-squared	0.996015	Mean dependent var	8.222658
Adjusted R-squared	0.995019	S.D. dependent var	0.054435
S.E. of regression	0.003842	Akaike info criterion	-8.024593
Sum squared resid	5.90E-05	Schwarz criterion	-8.094006
Log likelihood	26.07378	F-statistic	999.8540
Durbin-Watson stat	1.852022	Prob(F-statistic)	0.000006

Dependent Variable: LOG(L_IND)
Method: Least Squares
Sample: 1998 2001
Included observations: 4

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-2.384939	3.336618	-0.714777	0.5489
LOG(GDP_IND)	0.944922	0.291660	3.239804	0.0835

R-squared	0.839953	Mean dependent var	8.424629
Adjusted R-squared	0.759929	S.D. dependent var	0.120110
S.E. of regression	0.058850	Akaike info criterion	-2.520781
Sum squared resid	0.006927	Schwarz criterion	-2.827634
Log likelihood	7.041563	F-statistic	10.49633
Durbin-Watson stat	2.341199	Prob(F-statistic)	0.083511

Dependent Variable: LOG(L_IND)
Method: Least Squares
Sample: 1986 2001
Included observations: 16

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	6.239219	0.556943	11.20262	0.0000
LOG(GDP_IND)	0.187443	0.051287	3.654797	0.0026

R-squared	0.488258	Mean dependent var	8.273103
Adjusted R-squared	0.451705	S.D. dependent var	0.120359
S.E. of regression	0.089122	Akaike info criterion	-1.881152
Sum squared resid	0.111198	Schwarz criterion	-1.784578
Log likelihood	17.04921	F-statistic	13.35754
Durbin-Watson stat	0.690791	Prob(F-statistic)	0.002600

Dependent Variable: LOG(L_IND2)

Method: Least Squares
Sample: 1992 1997
Included observations: 6

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4.841361	0.061140	79.18548	0.0000
LOG(GDP_IND2)	0.294892	0.005952	49.54745	0.0000

R-squared	0.998373	Mean dependent var	7.870136
Adjusted R-squared	0.997967	S.D. dependent var	0.062251
S.E. of regression	0.002807	Akaike info criterion	-8.652140
Sum squared resid	3.15E-05	Schwarz criterion	-8.721553
Log likelihood	27.95642	F-statistic	2454.950
Durbin-Watson stat	2.566104	Prob(F-statistic)	0.000001

Dependent Variable: LOG(L_IND2)
Method: Least Squares
Sample: 1998 2001
Included observations: 4

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.475946	2.222820	-0.214118	0.8503
LOG(GDP_IND2)	0.792781	0.205780	3.852570	0.0613

R-squared	0.881251	Mean dependent var	8.087170
Adjusted R-squared	0.821877	S.D. dependent var	0.108522
S.E. of regression	0.045801	Akaike info criterion	-3.022159
Sum squared resid	0.004196	Schwarz criterion	-3.329012
Log likelihood	8.044319	F-statistic	14.84229
Durbin-Watson stat	2.432469	Prob(F-statistic)	0.061250

Dependent Variable: LOG(L_IND2)
Method: Least Squares
Sample: 1990 2001
Included observations: 12

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4.063776	0.332935	12.20591	0.0000
LOG(GDP_IND2)	0.371819	0.032061	11.59738	0.0000

R-squared	0.930795	Mean dependent var	7.922547
Adjusted R-squared	0.923875	S.D. dependent var	0.147426
S.E. of regression	0.040676	Akaike info criterion	-3.415351
Sum squared resid	0.016545	Schwarz criterion	-3.334533
Log likelihood	22.49210	F-statistic	134.4991
Durbin-Watson stat	1.074883	Prob(F-statistic)	0.000000

Dependent Variable: LOG(L_SER)
Method: Least Squares
Sample: 1986 1991
Included observations: 6

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.563383	1.016813	-0.554067	0.6090
LOG(GDP_SER)	0.820265	0.093967	8.729318	0.0009

R-squared	0.950125	Mean dependent var	8.312030
Adjusted R-squared	0.937657	S.D. dependent var	0.122363
S.E. of regression	0.030552	Akaike info criterion	-3.877551
Sum squared resid	0.003734	Schwarz criterion	-3.946964
Log likelihood	13.63265	F-statistic	76.20099
Durbin-Watson stat	1.608778	Prob(F-statistic)	0.000949

Dependent Variable: LOG(L_SER)

Method: Least Squares
Sample: 1992 1997
Included observations: 6

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.892863	0.147956	19.55219	0.0000
LOG(GDP_SER)	0.507753	0.013084	38.80664	0.0000

R-squared	0.997351	Mean dependent var	8.634051
Adjusted R-squared	0.996689	S.D. dependent var	0.081834
S.E. of regression	0.004709	Akaike info criterion	-7.617442
Sum squared resid	8.87E-05	Schwarz criterion	-7.686855
Log likelihood	24.85232	F-statistic	1505.955
Durbin-Watson stat	1.457662	Prob(F-statistic)	0.000003

Dependent Variable: LOG(L_SER)
Method: Least Squares
Sample: 1998 2001
Included observations: 4

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-13.38142	3.829547	-3.494256	0.0730
LOG(GDP_SER)	1.917050	0.329594	5.816395	0.0283

R-squared	0.944182	Mean dependent var	8.892521
Adjusted R-squared	0.916272	S.D. dependent var	0.117324
S.E. of regression	0.033949	Akaike info criterion	-3.621085
Sum squared resid	0.002305	Schwarz criterion	-3.927938
Log likelihood	9.242171	F-statistic	33.83045
Durbin-Watson stat	2.854823	Prob(F-statistic)	0.028310

Dependent Variable: LOG(L_SER)
Method: Least Squares
Sample: 1986 2001
Included observations: 16

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.589870	0.389025	1.516278	0.1517
LOG(GDP_SER)	0.713064	0.034711	20.54312	0.0000

R-squared	0.967891	Mean dependent var	8.577910
Adjusted R-squared	0.965598	S.D. dependent var	0.256726
S.E. of regression	0.047617	Akaike info criterion	-3.134781
Sum squared resid	0.031743	Schwarz criterion	-3.038207
Log likelihood	27.07825	F-statistic	422.0196
Durbin-Watson stat	0.850709	Prob(F-statistic)	0.000000

Appendix 3: Variables Used for Probit and Dprobit Models

Table 3.1: List of Variables

Name of variable	*Meaning*
1. INCOME	Real income of surveyed household readjusted by price indexes of regions and months (January, 1998=1) which can compares to year 1993
2. DURABLE	Values of durable assets of surveyed household
3. HHSIZE	Number of household members
4. GENDER	Dummy variable, equals 1 if household head is male, and 0 otherwise
5. FARM	Dummy variable classifying household head's job into agricultural and non–agricultural sectors (equal 1 if the job is agricultural; and 0 otherwise)
7. NONFARMONE	Dummy variable, equals 1 if household has at least one member involving in non-agricultural sector, and 0 otherwise
6. AGE	Age of household head
7. EDUC	Number of schooling years of household head
8. AVEREDUC	Average number of schooling years of all household members greater than 16 years old.
8. URBAN	Dummy variable, equals 1 if household is in urban, and 0 otherwise
9. DEPRATIO	The ratio of number independent people (under 15 and over 64 years of age) to number of dependent people (from 15 to 64 years of age)
10. CREDACC	Dummy variable, equals 1 if one or more member of household borrowed from formal credit organisations, 0 otherwise
11. PCLAND	Per capita land area (square m^2)
12. PCIRRGLAND	Per capita irrigated land area (square m^2)
13. AQUACULTURE	Dummy variable, equals 1 if household involves in aqua-cultural crops, 0 otherwise
14. PERINDCROP	Dummy variable, equals 1 if household grows perennial industrial crops, 0 otherwise
15. INFORSP	Dummy variable, equals 1 if household received information and technical support from the government agencies, 0 otherwise
16. REG1	Dummy variable, equals 1 if household lives in Northern Uplands
17. REG2	Dummy variable, equals 1 if household lives in Red River Delta
18. REG3	Dummy variable, equals 1 if household lives in Northern Central
19. REG4	Dummy variable, equals 1 if household lives in Central Coast
20. REG5	Dummy variable, equals 1 if household lives in Central Highlands
21. REG6	Dummy variable, equals 1 if household lives in Southeast
22. REG7	Base Dummy variable, equals 1 if household lives in Mekong Delta

Table 3.2: Summary of Statistics of Variables Used in Probit Models

Variable	*Mean*	*Std. Dev.*	*Min*	*Max*
POOR	0.26	0.44	0.00	1.00
INCOME	15734.48	23654.56	-29524.42	1110928.00
DURABLE	7121.47	34696.48	0.00	1069000.00
HHSIZE	4.75	1.95	1.00	19.00
GENDER	0.73	0.44	0.00	1.00
AGE	48.01	13.77	16.00	95.00
URBAN	0.29	0.45	0.00	1.00
FARM	0.57	0.49	0.00	1.00
DEPRATIO	0.39	0.25	0.00	1.00
CREDACCFM	0.30	0.46	0.00	1.00
EDUC	7.09	4.42	0.00	22.00
AVEREDUC	0.51	1.49	0.00	22.00
NONFARMONE	0.50	0.50	0.00	1.00
PCLAND	1931.87	2157.81	14.25	28250.00
PCIRRLAND	1256.39	1640.46	0.00	28250.00
PERINDCROP	0.30	0.46	0.00	1.00
AQUACULTURE	0.74	0.44	0.00	1.00
INFORSP	0.41	0.49	0.00	1.00
REG1	0.14	0.35	0.00	1.00
REG2	0.20	0.40	0.00	1.00
REG3	0.12	0.32	0.00	1.00
REG4	0.13	0.33	0.00	1.00
REG5	0.06	0.24	0.00	1.00
REG6	0.17	0.38	0.00	1.00
REG7	4.02	2.15	1.00	7.00

Appendix 4: Sampling Weights

The sample size selected for the 1997-98 Vietnam Living Standards Household Survey (VLSSII) is about 6000 households. The majority of the sample comprised of the households interviewed from 150 clusters selected in 1992-93 by the first VLSS survey (4800 households). However, an additional 1200 households were added to attain a sample size of 6000. This was done by selecting households from the total sample of the 1995 Multi-Purpose Household Survey (MPHS) of the General Statistical Office (GSO). In order to provide an adequate sample to disaggregate results into the seven major regions for rural areas and three categories of urban domains, the selection of the additional households was not proportional to population, but instead was made so that the total sample of 6000 households over-sampled specific domains. The factors for over-sampling are presented in the following table:

Sample Allocation

	Domain	***Relative Sampling Fraction***
	URBAN	
1	Hanoi, HCMC	2
2	Other cities	2
3	Other urban areas	1.5
	RURAL	
4	Northern Mountains	1
5	Red River Delta	1
6	North Central	1
7	Central Coast	1.5
8	Central Highlands	3
9	Southeast	2
10	Mekong Delta	1

In order to make estimates relating to groups of domains, or for the whole sample, the data must be weighted in order to correct the bias due to deliberate over- or under-sampling.

REFERENCES

Action Aid Vietnam, 1999. *Ha Tinh Province: A Participatory Poverty Assessment*, Hanoi.

Bales, S., Phung Duc Tung, and Ho Si Cuc, 2001. 'Sectoral Changes and Poverty', Chapter 3 in D. Haughton, J. Haughton, and Nguyen Phong (eds), *Living Standards during an Economic Boom*, Statistical Publishing House, Hanoi.

Belser, P., 1999. *Vietnam: On the Road to Labour-Intensive Growth*, Background Paper for Vietnam Development Report 2000.

Benjamin, D., and Brandt, L, 2001. *Agriculture and Income Distribution in Vietnam during the Reform Period*, MIMEO.

Central Institute for Economic Management, 2001. *Vietnam's Economy in 2000*, Statistical Publishing House, Hanoi.

Central Institute for Economic Management, 2002. *Vietnam's Economy in 2001*, National Political Publishers, Hanoi.

Centre for International Economics, 2002. *Vietnam Poverty Analysis*, Report Prepared for Australian Agency for International Development, Canberra and Sydney.

Deichmann, J., Haughton, D., Nguyen Phong, and Phung Duc Tung, 2001. 'Correlates of Living Standards: A Graphical and Statistical Analysis, Chapter 14 in D. Haughton, J. Haughton, and Nguyen Phong (eds), *Living Standards during an Economic Boom*, Statistical Publishing House, Hanoi.

Do Thien Kinh, Le Do Mach, Lo Thi Duc, Nguyen Ngoc Mai, Tran Quang, and Bui Xuan Du, 2001. 'Inequality', Chapter 2 in D. Haughton, J. Haughton, and Nguyen Phong (eds), *Living Standards during an Economic Boom*, Statistical Publishing House, Hanoi.

Dollar, D., and Glewwe, P., 1998. 'Poverty and Inequality in the Early Reform Period', Chapter 2 in D. Dollar, P. Glewwe, and J. Litvack, (eds), *Household Welfare and Vietnam's Transition*, World Bank Regional and Sectoral Studies, The World Bank, Washington D.C.

Fan, S., Hazell, P. and Thorat, S., 2000. 'Government Spending, Growth and Poverty in Rural India', *American Journal of Agricultural Economics*, No 4, 82: 1038-51.

Fan, S., Zhang, L., and Zhang, X., forthcoming. *Growth, Inequality, and Poverty in Rural China: The Role of Public Investments*, IFPRI Research Report 125, Washington DC.

General Statistical Office, 1990-2002. *Statistical Yearbook*, Statistical Publishing House, Hanoi. (Annual publication.)

General Statistical Office, 2000. *Socio-Economic Statistical Data of Vietnam 1975-2000*, Statistical Publishing House, Hanoi.

General Statistical Office, 2002. *Thong Bao Ket Qua So Bo Dieu Tra Muc Song Ho Gia Dinh Nam 2002 (Preliminary results of the Vietnam Living Standards Survey 2002*), MIMEO, Hanoi.

General Statistical Office, various data.

Glewwe, P., Gragnolati, M., and Zaman, H., 2000. *Who Gained from Vietnam's Boom in the 1990s? An Analysis of Poverty and Inequality Trends*, Working Paper No 2275, Development Research Group, the World Bank.

Gujarati, D.N., 1988, *Basic Econometrics*, Second Edition, McGraw-Hill International, New York.

Haughton, D., Haughton J., Le Thi Thanh Loan, Nguyen Phong, 2001. 'Shooting Stars and Sinking Stones', Chapter 7 in D. Haughton, J. Haughton, and Nguyen Phong (eds), *Living Standards during an Economic Boom*, Statistical Publishing House, Hanoi.

Haughton, J., 2001. 'Introduction: Extraordinary Changes', Chapter 1 in D. Haughton, J. Haughton, and Nguyen Phong (eds), *Living Standards during an Economic Boom*, Statistical Publishing House, Hanoi.

Hoang Van Kinh, Baulch, B., Le Quy Dang, Nguyen Van Dong, Ngo Doan Gac, and Nguyen Ngoc Khoa, 2001. 'Determinants of Earned Income', Chapter 6 in D. Haughton, J. Haughton, and Nguyen Phong (eds), *Living Standards during an Economic Boom*, Statistical Publishing House, Hanoi.

Islam Iyanatul, 2002. *Poverty, Employment and Wages: An Indonesian Perspective*, International Labour Organisation.

Johnston, J., and DinNardo, J., 1977. *Econometric Methods*, Fourth Edition, McGraw-Hill Companies, Inc., New York.

Le Dang Doanh, Vo Tri Thanh, Pham Lan Huong, Dinh Hien Minh, Nguyen Quang Thang, 2002. *Explaining Growth in Vietnam*, in Global Research Project (country Studies), 2002.

Long, J.S., 1997. *Regression Model for Categorical and Limited Dependent Variables*, International Educational and Professional Publisher, London.

Ministry of Labour, Invalids and Social Affairs, 1997. *Status of Labour-Employment in Vietnam 1996*, Statistical Publishing House, Hanoi.

Ministry of Labour, Invalids and Social Affairs, 1998. *Status of Labour-Employment in Vietnam 1997*, Statistical Publishing House, Hanoi.

Ministry of Labour, Invalids and Social Affairs, 1999. *Status of Labour-Employment in Vietnam 1998*, Statistical Publishing House, Hanoi.

Ministry of Labour, Invalids and Social Affairs, 2000. *Status of Labour-Employment in Vietnam 1999*, Statistical Publishing House, Hanoi.

Ministry of Labour, Invalids and Social Affairs, 2001. *Status of Labour-Employment in Vietnam 2000*, Labour and Social Affairs Publishing House, Hanoi.

Ministry of Labour, Invalids and Social Affairs, 2002. *Statistical Data of Labour-Employment in Vietnam 2001*, Labour-Social Publishing House, Hanoi.

Ministry of Labour, Invalids and Social Affairs, various data.

Mountain Rural Development Program, 1999. *Lao Cai Province: A Participatory Poverty Assessment*, Vietnam- Sweden Mountain Rural Development Program and the Vietnam-Sweden Health Cooperation Program, Hanoi.

National Centre for Social Sciences and Humanities, 2001. *National Human Development Report 2001: Doi Moi and Human Development in Vietnam*, Political Publishing House, Hanoi.

Oxfam Great Britain. 1999. *Tra Vinh Province: A Participatory Poverty Assessment*, Hanoi.

Poverty Task Force, 2002a. *Localising IDTs for Poverty Reduction in Vietnam: Enhancing Access to Basic Infrastructure*, Hanoi.

Poverty Task Force, 2002b. *Summary of the Eight Papers on Localising the MDGs for Poverty Reduction in Vietnam: Achieving the Vietnam Development Goals: an Overview of*

Progress and Challenges, Hanoi.

Poverty Working Group, 1999. *Vietnam Development Report 2000: Attacking Poverty*, Joint Report of the Government-Donor-NGO Poverty Working Group, Consultative Group Meeting for Vietnam, December 14-15, 1999, Vietnam.

Save the Children UK, 1999. *Ho Chi Minh City: A Participatory Poverty Assessment*, Hanoi.

Socialist Republic of Vietnam, 2002. *The Comprehensive Poverty Reduction and Growth Strategy*, Hanoi.

State Committee for Ethnic Minorities and Mountainous Areas Affairs, 2001. *Bao Cao So Ket Thuc Hien Chuong Trinh Phat Trien Kinh Te – Xa Hoi Cac Xa Dac Biet Kho Khan Mien Nui Va Vung Sau Vung Xa Hai Nam (1999-2000) Va Ke Hoach Nam 2001 (Preliminary Report on Implementation of the National Program for Socio-Economic Development in Communes Suffering Special Hardship in Mountainous and Remote Areas during two years 1999-2000 and the Plan for 2001)*, Report Prepared for the National Conference Summing up Two Years of Implementation of the Program and Realisation of the 2001 Plan on 10-12 May 2001, Hanoi.

Tran Van Tho, Nguyen Ngoc Duc, Nguyen Van Chinh, Nguyen Quan, 2000. *Kinh Te Viet Nam 1955 – 2000, (Vietnam's Economy 1955-2000)*, Statistical Publishing House, Hanoi.

United Nations Development Programme, 1996. *Vietnam Public Expenditure Review*, Volume 1, Hanoi.

Van de Walle, D., 2001. *The Static and Dynamic Incidence of Vietnam's Public Safety Net*, World Bank, Washington D.C.

World Bank, 2000. *World Development Report, 2000/2001*, New York and Oxford: Oxford University Press.

World Bank, 2001. *Implementing Reforms for Faster Growth and Poverty Reduction*, Vietnam Development Report 2002, Hanoi.

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