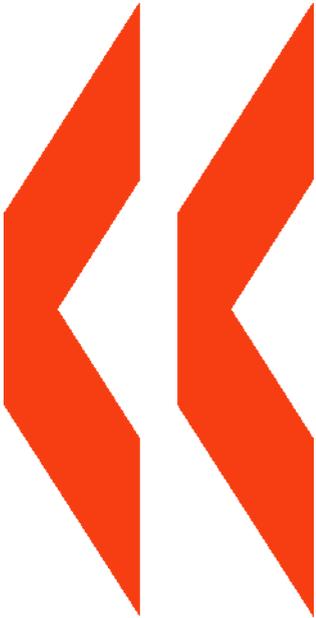


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Economic Importance of Agriculture for Sustainable Development and Poverty Reduction: The Case Study of Vietnam

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ECONOMIC IMPORTANCE OF AGRICULTURE FOR SUSTAINABLE DEVELOPMENT AND POVERTY REDUCTION: THE CASE STUDY OF VIETNAM

1. Economic and policy context

1. Vietnam's rapid economic and social development in the past quarter century has few parallels in economic history. In the early 1980s the country was one of the poorest in the world, suffering from hyperinflation, stagnating per capita income growth, declining food production per capita and widespread famine. By the mid-1990s however, the government had restored macroeconomic stability, GDP growth had accelerated and the country had become a major exporter of rice, coffee and many other agricultural and industrial products.

2. Success in reducing poverty was even more amazing. In 1993, nearly 60% of the population fell below the international dollar a day poverty line. Latest data (2006) place that rate at under 16%. Not even neighbouring economic growth powerhouses Thailand and China achieved such swift progress against poverty. Indeed only two or three countries in the entire world posted faster rates of poverty reduction than Vietnam over that period. Already by 2002 Vietnam had fully achieved the Millennium Development Goal of halving, by 2015, that dollar a day poverty rate.

3. What explains Vietnam's impressive economic and social achievements? Most credit goes to a package of policy reforms implemented beginning in 1988 called the Doi Moi policy. Literally translated, Doi Moi means *change and renewal*, and is the label the Vietnamese government adopted for economic reform and renovation. At the heart of those reforms was the near abandonment of central planning in favour of a progressive move towards a regulated, but market-based, economy – sometimes referred to as market socialism.

4. Following the introduction of the Doi Moi policy Vietnam gradually evolved from a closed and moribund command economy to a rapidly growing market economy highly integrated with global markets. The reforms were comprehensive, affecting almost all aspects of economic life in the country. However it was the profound changes to agricultural policy that have garnered most attention, providing both the initial impetus for the reforms and, later, vindicating them.

5. Vietnam is well-endowed with the land and water resources suitable for food production. Yet, under collectivized agriculture, production languished. In 1986 amid widespread food shortages and fears of famine the country had to import nearly 500 thousand tonnes of rice to meet food requirements. The consequent social unrest weakened political resistance to reform, setting the stage for the country's economic transformation.

6. Agricultural progress has also been the hallmark of economic success attributed to Doi Moi. The pervasive land and market reforms in agriculture fostered a transition away from a system of production based on public ownership and control towards one in which farm households possess effective property rights over land and farm assets and make production decisions guided by market signals. This transition significantly increased production incentives and output. In 2009 the country exported over 5 million tonnes of rice placing Vietnam second only to Thailand in the world rice market.

7. This case study seeks to distil lessons from Vietnam's outstanding agricultural progress for policy makers wishing to foster agricultural performance for poverty reduction in other developing countries. We begin with a brief overview of macroeconomic and trade policy developments and selected indicators of economic performance. We then turn to a slightly more in-depth discussion of the profound changes to Vietnam's agricultural policy and the turnaround in sectoral performance they engendered. The following section chronicles the evolution of income distribution and poverty, exploiting the data obtained from poverty surveys implemented first in 1993 and then in two-year intervals beginning in 1998 through 2008. The fourth and last substantive section discusses findings from analysis aimed at quantifying agriculture's contribution to poverty reduction achieved in Vietnam. The final section concludes and draws some policy implications.

Macroeconomic and trade policy reforms

8. The policy changes the Vietnamese government introduced beginning in 1988 that so remarkably transformed Vietnam's economy focused first and mainly on agriculture. However, there were significant reforms to macroeconomic and trade policy as well – reforms that fostered the macroeconomic stability and market openness generally regarded as essential pre-conditions for agricultural progress (Dollar, 2004; World Bank, 2008). Macroeconomic reforms are comprehensively documented and critically evaluated in Dollar and Litvack (1994); Dollar (2004); Leung and Riedel (2001). More in-depth analyses of the trade policy developments are in Athukorala (2006) and Athukorala, Huong and Thang (2009).

9. The first target of the macroeconomic reforms was hyperinflation caused largely by massive government deficits incurred in subsidising unprofitable state owned enterprises (Dollar, 2004); (Leung and Riedel (2001). In the three years leading up to the introduction of the Doi Moi policy in 1988, Vietnam's annual inflation rate, as measured by the GDP deflator, averaged nearly 400% (World Bank, 2010). The government responded by sharply increasing interest rates, changing the tax system to generate more revenue and introducing stringent fiscal restraint to reduce budgetary deficits.

10. Much of the spending reduction was the result of closing or selling off unprofitable state owned enterprises and reducing the number of employees at many of those that remained. Between 1989 and 1992 the number of SOEs was cut in half and around 800 000 employees (roughly one-third of the initial total) left the sector (Glewwe, 2004). Production and consumption subsidies were eliminated from the state budget, interest rates on loans to state-owned firms were raised, and central bank credit was no longer used to finance the budget deficit. Additional savings came from a reduction in military force that resulted in the return of upwards of a half a million soldiers to the civilian workforce (Dollar and Litvack, 1994; Do and Iyer, 2008).

11. The package of policy measures the Vietnamese government introduced to curb inflation and restore macroeconomic stability closely resembles the Structural Adjustment Programs widely promoted by the World Bank and the International Monetary Fund in that era. Indeed, Dollar and Litvack (1994) have labelled Vietnam's achievements in monetary and fiscal restraint during the early 1990s, 'successful structural adjustment', noting however that Vietnam differed from other countries then being encouraged to follow the policy prescriptions of the World Bank and the IMF in that it did not, at the time, receive any financial support from those institutions.

12. The government massively overhauled trade policy simultaneously with the changes to monetary and fiscal policies. In 1989 exchange rates were unified and then sharply devalued, from 900 dong per dollar to 5 000 dong per dollar - the rate prevailing in the black market at the time. Since then the Vietnamese dong has been on a managed floating exchange rate regime whereby the State Bank of Vietnam (the central bank) determines the unified rate according to developments on the foreign exchange market. The devaluation greatly strengthened incentives to export, incentives that were further bolstered by

the progressive lifting of barriers to exports and imports beginning in the late 1980s, continuing through 1990s.

13. Before the reform, Vietnam’s trade policy featured both high tariffs and quantitative restrictions applying to both imports and exports. Twenty-five years on, tariffs constitute the main instrument used in regulating imports and restrictions on exports apply to only a few items (Athukorala, 2006). Import tariffs gradually decreased from an average of over 20% in the early 1990s to just under 12% in 2006 (MFN trade weighted basis). Quantitative restrictions applied to only 1.2% of total imports in 2006.

14. Vietnam further signalled its commitment to trade liberalisation by entering into a number of regional, bilateral and multilateral trade agreements. In 1992, the country signed a preferential trade agreement with the European Economic Community. It joined Association of South East Asian Nations (ASEAN) and the ASEAN Free Trade Area (AFTA) in 1995. In 2002, the country entered into a bilateral trading agreement with the United States – the most comprehensive bilateral agreement the United States has ever signed with a developing country (Athukorala, 2006). Latest WTO data (2007) show the United States as Vietnam’s most important trading partner, ranking just ahead of the European Communities in its total imports from Vietnam. Japan, Australia and China are the other main destinations for the Vietnam’s exports. Vietnam became the WTO’s 150th member on 11 January 2007.

Economic performance

15. Did the macroeconomic and trade policy reforms work? The general consensus from the various studies cited above is that they did. Table 1 contains indicators lending support to such a conclusion. The first column compares Vietnam’s annual per capita GDP growth for the period 1985 to 2005 to that of neighbouring countries in the region: China, Indonesia, Malaysia and Thailand - four countries posting some of the fastest rates of economic growth in the world over those years. Vietnam out-performed all of them except China.

Table 1. Macroeconomic indicators

Country	GDP per capita annual growth, 1985-2007	Composite macroeconomic stability index			Trade Openness (Trade as % of GDP)		
		1985	2005	Annual growth	1986	2005	Annual change
		China	8.61%	7.77	8.50	2.39%	26.33
Indonesia	3.21%	5.60	8.00	0.99%	39.97	54.85	0.95
Malaysia	4.00%	7.07	8.50	1.37%	104.95	200.08	4.92
Thailand	4.30%	6.57	9.00	1.53%	49.17	144.15	4.63
Vietnam	5.51%	4.60	8.00	4.93%	23.22	167.01	6.13

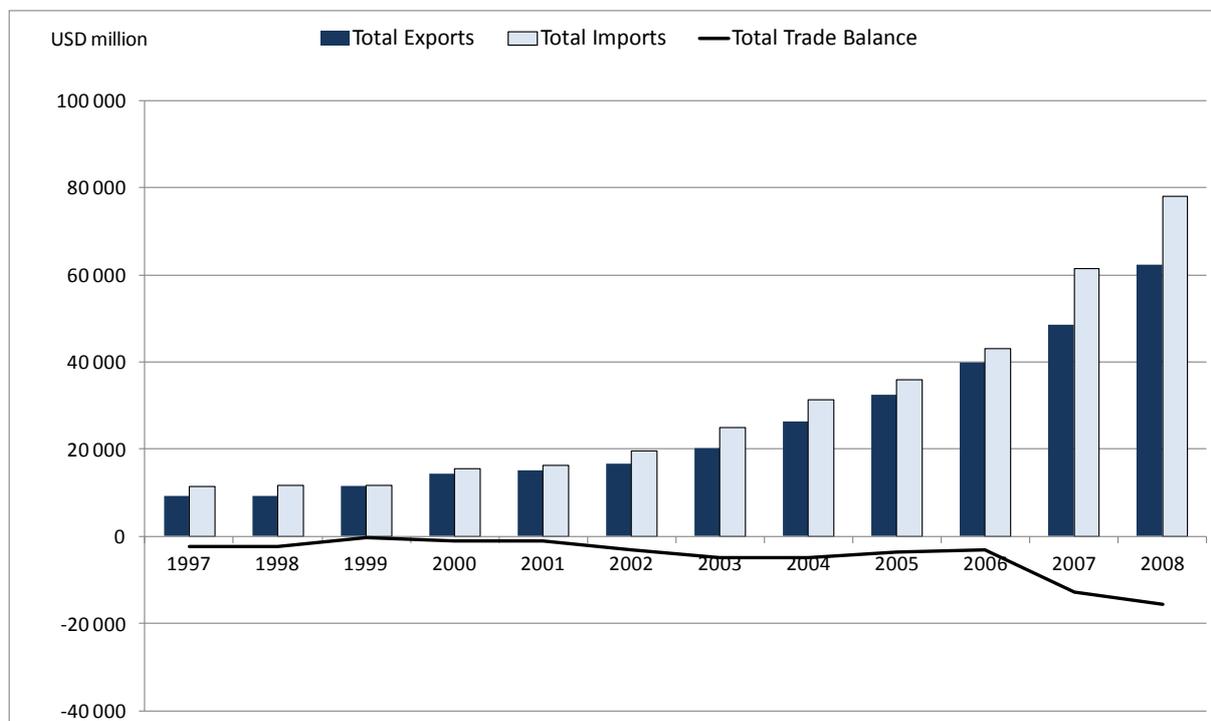
Source: World Bank, 2010; PRS-Group, 2009.

16. The next set of columns compares those countries using an indicator of overall economic health and based on data from the International Country Risk Guide (PRS-Group, 2009). A country’s overall score on this indicator is the average of its scores on three sub-measures: budget balance, inflation and exchange rate stability. In 1985 when Vietnam’s economy was at the worst of its crisis the country’s score was at the bottom of the range. After posting a rate of progress faster than any other country on the list it was in 2005 very near the top.

17. The final three columns indicate Vietnam’s progressive opening to trade following reforms. In 1985 trade volume (sum of exports and imports) was only 23% of GDP, lowest among all the countries for

which figures are reported in Table 1. By 2005, having risen at a pace faster than any other countries in the list, that figure had risen to 167%, second only to Malaysia. Figure 1 illustrates this growing importance of trade for Vietnam. The dollar volume of imports and exports increased nearly eight-fold between 1997 and 2008.

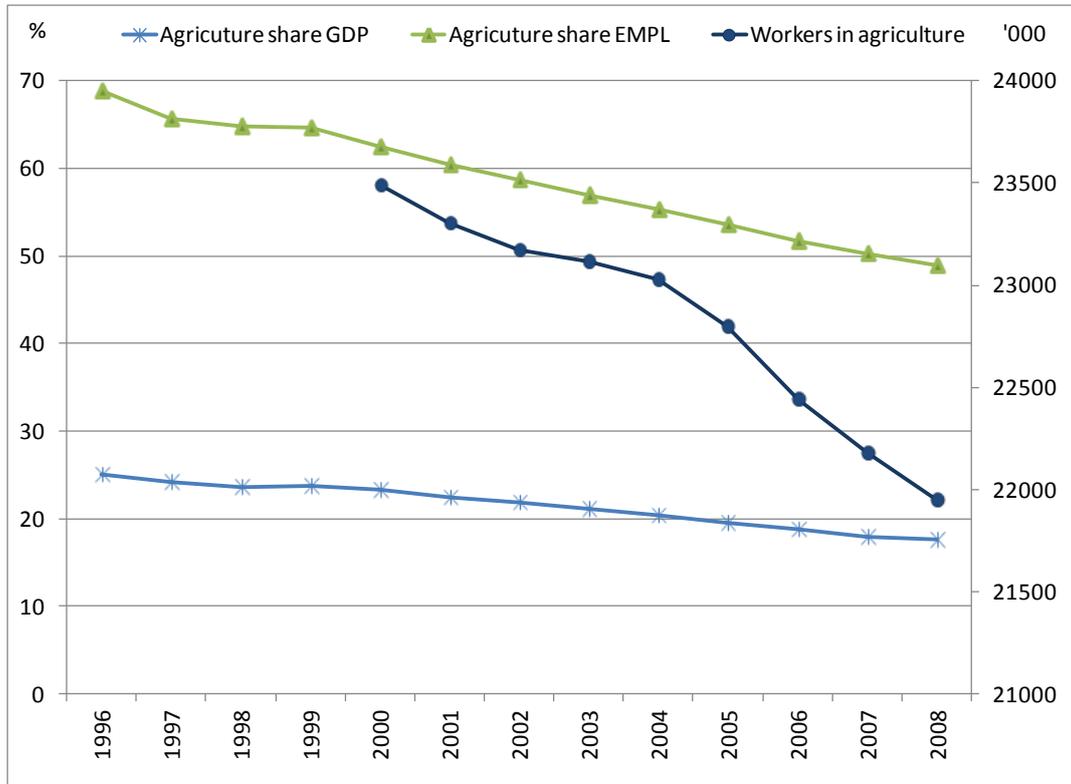
Figure 1. Vietnam's evolution of trade, 1997-2008



Source: UN Comtrade, 2010.

18. In developing countries returns to labour employed in agriculture are typically below, often substantially below, returns to labour in other sectors. A characteristic feature of successful development is the re-allocation of labour from low return agricultural occupations to more financially rewarding employment in other sectors. With rare exception, as economies develop the share of the workforce employed in agriculture declines. Frequently, as is the case now in Vietnam, the absolute number of workers in agriculture falls. Figure 2 presents these trends. The total size of the agricultural workforce has been declining at just under 1% per year since 2000, the earliest year of official employment data. Agriculture's share of total employment fell even more sharply, from nearly two-thirds of the total workforce in 2000 to less than half in 2008.

Figure 2. Agricultural employment and GDP trends 2000-08

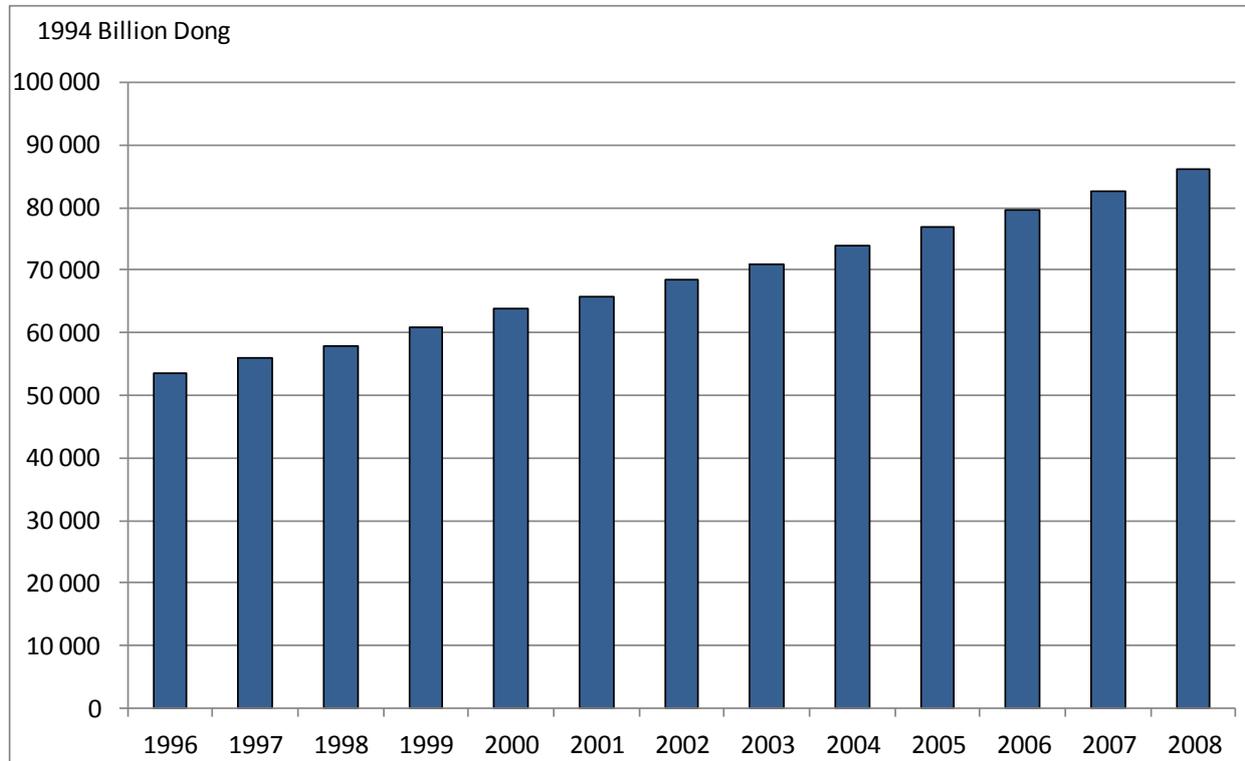


Source: GSO, 2010.

19. Several inter-related factors underlie these employment trends. First, as seems likely, productivity advance in agriculture may have strongly favoured the adoption of techniques of production that were labour-saving thereby freeing up labour time for off-farm work. Similarly, as noted below, being able to transfer land use rights added further to the flexibility of farmers and their families to allocate work time among alternatives. Additionally, not only were the wage gaps large in absolute terms but with widespread economic growth in Vietnam off-farm wages have continued to climb.

20. As the number of people employed in the sector falls, earnings per worker must rise – except as the total value of sector income falls. In fact however, agricultural GDP has grown at a steady pace of more than 4% per year since 1996 (Figure 3). That is, a growing sector-wide income was available for distribution among fewer workers thereby enabling the increase in per worker earnings.

Figure 3. Evolution of agricultural GDP in Vietnam



Source: GSO, 2010.

2. Agricultural policy reforms and sector performance

21. When Vietnam was reunified following the defeat of the government in south in 1976 the government launched an effort to extend nation-wide the system of collectivized agriculture then operating in the north. Under that system the fundamental units of economic organization of agriculture were agricultural cooperatives. These held responsibility for deploying labour, land and materials in pursuit of production plans developed by central governing authorities. They also controlled marketing functions, collecting and selling surplus product to the state at state-controlled prices and, when called upon to do so, implementing mandatory procurement of selected essential commodities (Athukorala, Huong and Thanh, 2009).

22. However, there was resistance to the collective system by farmers in the south and growth in total output slowed soon after the attempt to introduce it began (Che, Kompas and Vousden, 2006). Per capita rice production actually fell in both 1977 and 1978 and the country was forced to import to meet food needs. As shortages of food developed, serious doubts arose amongst the population and in some policy circles about the efficiency of collectivized agriculture (Ravallion and van de Walle, 2008). The government responded by introducing in 1981 a contract system for agriculture, similar to the household responsibility system in China. In this first tentative move to limited property rights and reliance on markets, the cooperatives allotted plots of land to households and allowed them greater responsibility in making land management and production decisions (Leung and Reidel, 2006). Under the new rules, households contracted to deliver set amounts to the cooperatives at below-market, regulated prices but were freed to sell any surplus above the contracted quantities at substantially higher market prices.

23. Though apparently successful in boosting production in the early years of the 1980s, the reform movement lost momentum amid renewed efforts by hard-liners within the Communist Party of Vietnam to enforce the collectivization of agriculture (Athukorala, Huong and Thanh, 2009). Food production again slowed, leaving many parts of the country once more suffering food shortages and near-famine conditions. Per capita rice production was significantly below trend in 1986 and fell in both 1987 and 1988; imports in 1986 were nearly half a million tonnes. Collectivization was widely deemed a failure. The decision to finally abandon central planning in favour of a market-based economy was officially taken at the Sixth Congress of the Vietnamese Communist Party (VCP) in 1986.

24. With the adoption of the Doi Moi reforms the government signalled a sea change in agricultural policy perspective. The earlier experiment with output contracts had been an attempt to fix collective agriculture to make the system work better. However, in accepting Doi Moi, the government rejected the system altogether. The transformative idea was that households rather than cooperatives should be the key economic agents in the sector. Individual farmers, not cooperatives, were to make decisions over farm inputs and outputs guided by free market signals.

25. Implemented in phases beginning in 1988 the reforms fundamentally changed both the structure of property rights and the market environment in which farmers operated. The most important changes, both substantively and symbolically, were to laws governing land tenure. These created the enabling environment needed for farmers to respond to incentives created by the accompanying and far-reaching domestic market price reforms. With these land and market reforms Vietnam transitioned in a relatively short few years from a highly centralized collectivized agriculture to a type of free-market agriculture not unlike that found in many non-socialist countries.

Land tenure reforms

26. Freeing up Vietnam's agricultural land markets has been termed one the most radical land reforms in modern times (Ravallion and van de Walle, 2008). The first major step was taken with the introduction of 1988 Land Law. That law called for individual households to be assigned the use rights to some 80% to 85% of the country's agricultural land area – comprising about 4 million hectares. In the initial phase of implementation, farm households were granted conditional rights to use private land for a period of 10-15 years. However, the land remained the property of the state to be reverted to government control when a household moved or stopped farming. This limited the potential effectiveness of the reforms since they ruled out the possibility of trading tenure rights thus forestalling the development of a land market.

27. In 1993, the government took the second big step towards privatization of land rights with the introduction of a new land law and issuance of land use certificates. Although land still remained the property of the state, under the new law usage rights could legally be transferred, sold, leased, bequeathed and used as collateral for loans. The duration of tenure rights was extended to 20 years for the production of annual crops and to 50 years for perennials.

28. Vietnam's land titling process was one of the most ambitious ever attempted in the developing world both in scale (nearly 11 million land titles had been issued to rural households by the year 2000) and the speed with which it was implemented (Do and Iyer, 2008). Not surprisingly, these dramatic changes in land tenure rights have attracted much attention from development economists resulting in the publication of numerous economic studies in recent years. (Annex Table A.4 contains data showing the structure of land holdings in Vietnam in 2006.)

29. Using a model of household consumption and data from the Vietnam Living Standard Surveys (VLSS) Ravallion and van de Walle (2008) compare the realized land allocation with two

counterfactuals: 1) an egalitarian allocation whereby each eligible household is given the same irrigated-land equivalent per person and 2) a consumption-efficient allocation whereby the aggregate gain in consumer welfare is maximized.

30. They conclude that the observed allocations correspond most closely to the first of those two, *i.e.*, an egalitarian allocation. The consumption-efficient allocation would have yielded somewhat higher aggregate welfare gains but the benefits would not have been as great for the poor. They then examine the efficiency and equity benefits of the broadening of tenure rights under the 1993 change to the law. Here they conclude that despite some popular opinion to the contrary, the efficiency gains achieved subsequent to those reforms have not come at the expense of increased inequality. Although there was an apparent rise in landlessness subsequent to the reforms there has been no rise in poverty attributable to the land market reforms. They conclude that, on the contrary, rising rural landlessness appears to have been poverty reducing as farm households take up new opportunities in the off-farm labour market.

31. Do and Iyer (2008) use data from the 1993 and 1998 VLSS to estimate the impact of land rights on real household expenditures and on the per hectare value of agricultural output. They find that the reforms had positive but statistically insignificant and relatively minor impacts on both these variables. In separate regressions they estimate the effects of the reforms on long-term agricultural investments and on decisions by farmers to allocate time to off-farm work. Such effects may not show up directly and immediately in earnings per worker but could lay the ground work for long term improvements. Here, they found statistically significant and positive but small effects.

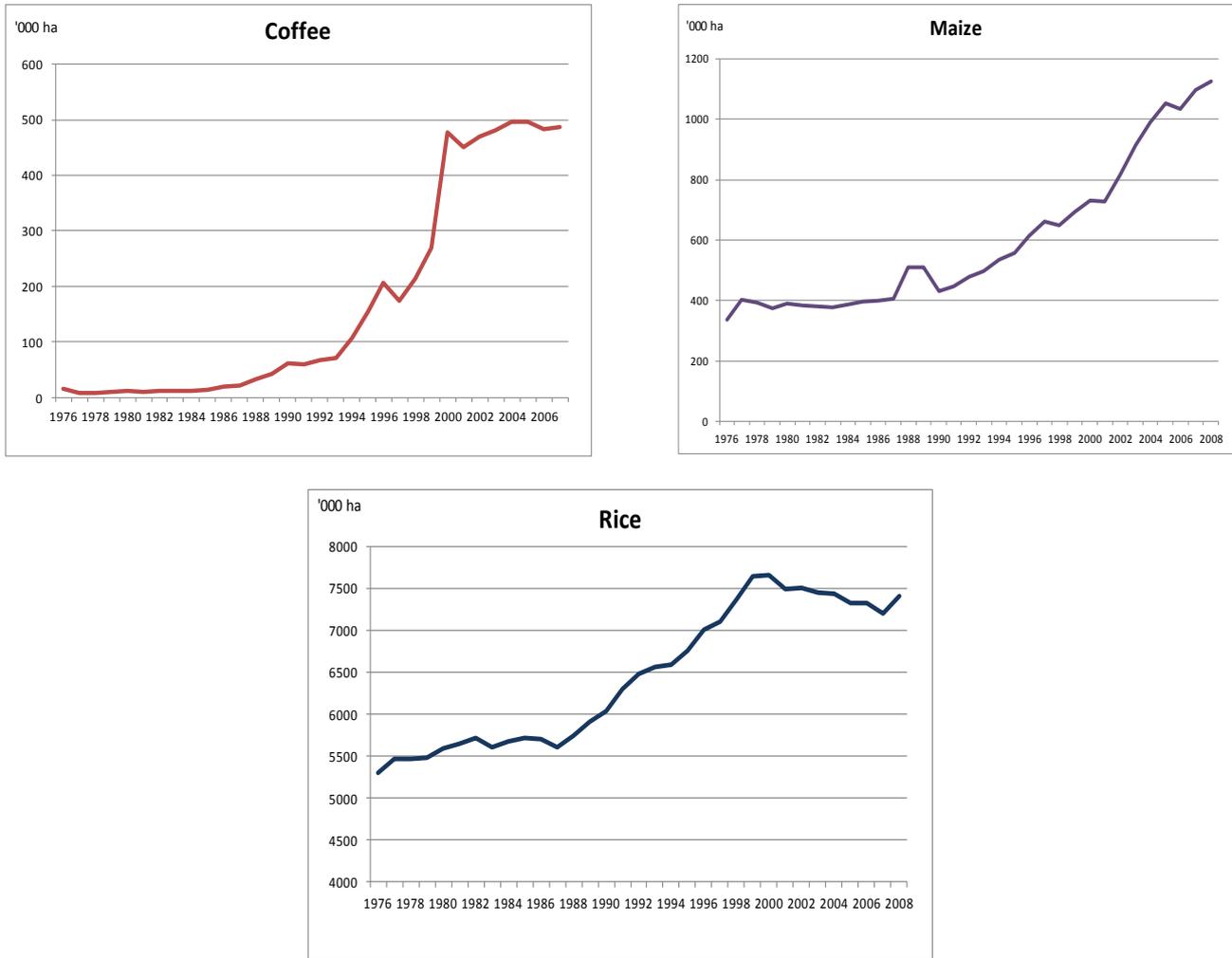
32. Using data from the same two surveys, Deininger and Lin (2003) find that the existence of markets allowing rental and sale of land had positive effects on productivity and provided opportunities for farm households with higher levels of ability to access land. They attribute this result to the combination of a relatively egalitarian distribution of tenure rights and rapid growth of off-farm earning opportunities.

33. Van de Broeck, Newman and Tarp (2007) studied the effects of land titles on rice yields that that yields on plots for which there is a formal title are significantly higher than on plots with no defined land rights leading them to conclude that granting full and exclusive ownership rights to land had a significant productivity enhancing effect. However, they were unable to establish that connection in cases where the land title grants joint ownership rights.

34. Markussen, Tarp and Van den Broek (2009) also highlight the connection between the existence of an effective system of land rights and potential growth in non-farm employment. They found that the 1993 expansion of land tenure rights increased supply of off-farm work. The main focus of the latter study was however the unfinished agenda for land reform in Vietnam, concluding that remaining land use restrictions lead to sub-optimal crop choices and efficiency losses.

35. Cropping area began expanding at a faster than usual pace (dramatically so in the case of coffee) beginning almost immediately following the first reforms to the land laws and continued unabated throughout the 1990s (Figure 4). There seems little doubt that the land reforms contributed substantially to the observed increase in plantings as well as to the changing composition of land use.

Figure 4. Evolution of coffee, maize and rice planted area in Vietnam



Source: GSO, 2010.

36. Farm income comprises returns to the land, labour and fixed capital owned by farmers. The observed increase in plantings from the late 1980s throughout the 1990s was thus surely accompanied by an increase in returns to land and thus in total farm income. Since the number of agricultural workers was stable to declining during those years, it seems equally certain that earnings per person employed in the sector would have been boosted by this development. Cereals account for the greatest share of the area planted to crops in Vietnam and that total grew as well, *i.e.*, the increased plantings shown in Figure 4 was the consequence expansion of plantings on to land not previously cropped.

Market reforms

37. The government introduced extensive domestic market reforms accompanying the land tenure reforms. The first phase of the reforms, 1987 and 1988, saw the gradual removal of price controls for agricultural goods and the dismantling of the rationing system for many commodities. International trade in agricultural products was gradually liberalized from 1989, allowing increased private sector participation at successive stages. In 1990 procurement of farm products by the state (usually at prices below the free market) formally ended, allowing farmers to sell their produce at prices largely determined by domestic

market conditions. The weakening of the state trading system at the local level not only permitted private traders to develop local markets but state trading enterprises also became more responsive to market opportunities.

38. Before the reforms fertilizer supply was constrained by restrictive policies regulating imports. In 1991 however import quota rights for fertilizer were granted to central and state-owned enterprises that earned foreign exchange. Then, in 2001, the import quota system for fertilizer was abandoned altogether. Following these developments imports rose sharply and fertilizer market prices fell (Benjamin and Brandt (2004). The total tonnage of fertilizer imports nearly doubled between 1995 and 2004, before high world prices apparently began to choke off demand (Benson and Brandt, 2002).

39. As elsewhere in the region, rice is a profoundly important crop in Vietnam – culturally, politically and economically. It is the main source of calories for food consumers and the main source of income for most food producers. Political crises provoked by rice production shortfalls in the late 1970s and again in the late 1980s, triggered the policy reforms that changed Vietnam’s entire economy and society. Correspondingly, the dramatic turnaround in rice productivity, production and exports following their implementation is widely interpreted as evidence of the success of those reforms (Che, Kompas and Vousden, 2006; Kompas *et al.*, 2009).

40. In addition to the progressive dismantling of government control over rice pricing and procurement there were also important changes to rice trade policy. The most important was the progressive relaxing of restrictions on both internal and external trade in rice (Benjamin and Brandt, 2004). With a return to robust production levels in 1989 the country began exporting rice. However those exports were subject to licensing to ensure adequate domestic supplies and reduce price volatility on the domestic market. There were at the same time barriers to internal trade that had restricted flows of rice from rice surplus regions in the south to rice deficit regions in the north. Those restrictions on internal and external trade had kept rice prices artificially low in the south and impeded the transmission of price signals.

41. Initially, licenses to export rice were issued to only a few state-owned enterprises. Athukorala, Huong and Thanh (2009) point to intense lobbying efforts by these enterprises to share in the export quota as evidence that the quotas were probably binding and thus pushed domestic market prices below corresponding border prices. However, with rice production and marketable surpluses continuing to increase sharply throughout the 1990s, concerns about food security could no longer justify the system of internal and external restrictions. A law passed in 1997 lifted internal barriers to trade and the system of export quotas was abolished in 2001. Beginning then, enterprises were required only to possess a general license to trade in agricultural products in order to export rice.

42. One way of measuring Vietnam’s progress in reforming agricultural markets is to examine trends in domestic price distortions using an indicator called the Nominal Rate of Assistance (NRA), typically obtained by comparing the border and domestic prices of the same commodity. A negative NRA indicates that government interventions in agricultural markets depress domestic market prices below corresponding world price levels. This is often interpreted to mean that the government is, in effect, taxing the sector. Symmetrically, a positive NRA indicates that domestic market prices are higher than the corresponding world market levels and that government is, in effect, subsidising the sector.

43. Athukorala, Huong and Thanh (2009) estimate annual NRA’s for five of Vietnam’s exportable commodities: rice, rubber, coffee, pigmeat and poultry and for one of its importables – sugar for the period 1986 to 2004. Combined, those commodities represent around two-thirds of the value of agricultural production. The annual average NRA for all covered commodities trended upward throughout the study period, albeit with a high degree of variability across years and individual commodities. That average was substantially negative in the first ten years of their study period, before the market reforms had been fully

implemented. In the second ten years of that study period however, the all-commodity average was positive. That turnaround indicates that reforming Vietnam's agricultural markets substantially reversed the price depressing effects of the Vietnam's former system of state-owned control of processing and trade of agricultural commodities.

Agricultural research and development

44. There are numerous studies devoted to explaining and analyzing Vietnam's pervasive land and market reforms. Surprisingly little attention has been paid to the concurrent rapid growth in government investment in agricultural research and development (R&D). Such investments are known to yield high social returns and undoubtedly have contributed partly to Vietnam's astonishing progress in agriculture.

45. The table below presents trends in two indicators: 1) total investment in real (2005 PPP) international dollars and 2) the ratio of that total to agricultural GDP expressed as a per cent. The table includes comparable data for China, Indonesia, Malaysia and Thailand taken from the Agricultural Science and Technology (ASTI) online database.

46. In 1991, the first year for which ASTI reports data for Vietnam, total expenditures amounted to USD 8.2 million (2005, PPP USD), an amount constituting less than one-third of one per cent of agricultural GDP, a score placing Vietnam well behind neighbouring China and Malaysia. By 2002 however, thanks to a near seven-fold increase in spending the country had begun to close the gap, an increase that is especially noteworthy as over that same time period agricultural GDP was rising rapidly. Nonetheless, the country remains well behind the other countries listed in the table in the share of agricultural GDP spent on research and development.

Table 2. Trends in agricultural R&D

	Total expenditures Million 2005 PPP USD		Research Intensity Total expenditures as % of Ag GDP		Growth % change in total 1991-2002
	1991	2002	1991	2002	
	China	1 178.0	2 582.5	0.35	
Indonesia	n/a	184.4	n/a	0.18	-7.28%
Malaysia	238.5	446.5	1.25	1.92	4.44%
Vietnam	8.2	55.9	0.03	0.17	19.06%

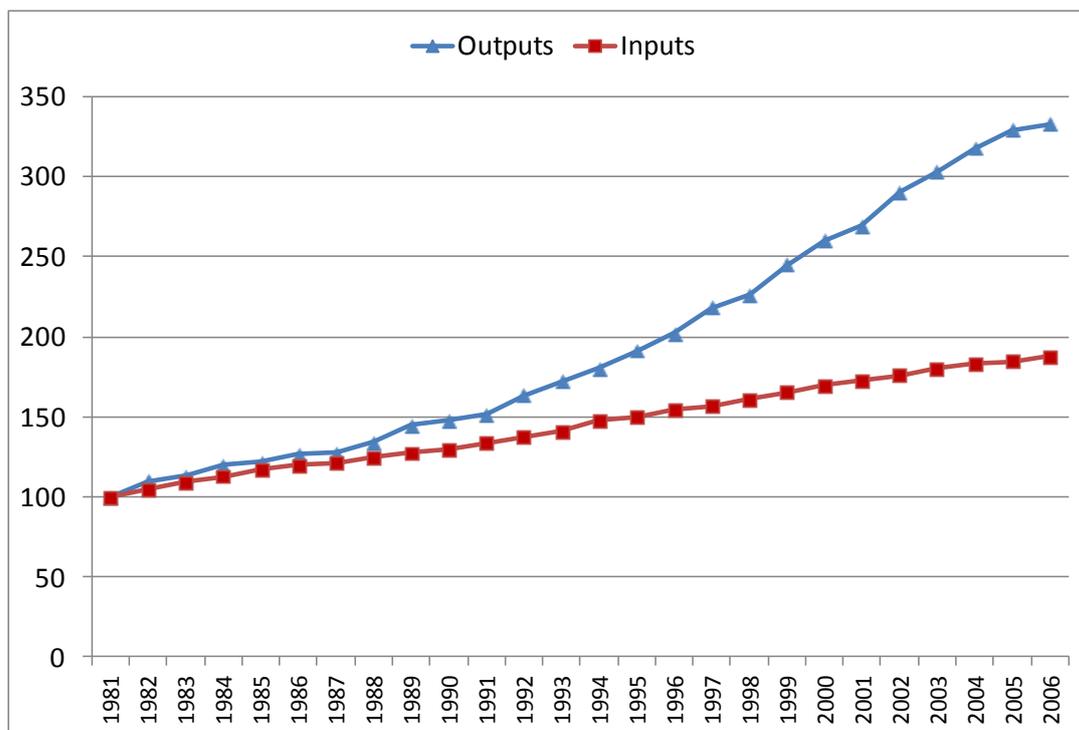
Source: ASTI-IFPRI, 2009.

47. From the farmer's perspective, higher total factor productivity (TFP) means either that the same output can be produced at lower costs or that more output can be produced at the same costs. Thus, a higher TFP would normally lead to an increase in net farm incomes. It is theoretically possible however that, if productivity gains boost production by enough, output prices and farm incomes could fall (Alston and Martin, 1994). This seems unlikely in Vietnam's case since the rapid expansion of agricultural output was due to increased productivity and production of commodities highly tradable on world markets – rice, maize and coffee. Although the country is presently the world's second largest exporter of rice and coffee, its share of world production of even those commodities is probably not great enough for variations in Vietnam's production to have much impact on world market prices.

48. Growth in TFP is largely attributable to technological changes enabled by public investments in agricultural research extension and education. There is an extensive literature showing high social payoffs to those investments (Alston, Beddow and Pardey, 2009). Figure 5 compares the evolution of indexes of aggregate output and input use in Vietnamese agriculture for 1981-2006 using data taken from Fuglie

(2008). TFP is that part of the increase in aggregate output not explained by an increase in total input use. Thus the trend in the gap between the output and input indexes tracks developments in the TFP. Notice that beginning in the early 1990s that gap began to grow. Since then TFP growth has averaged around 3% per year, a pace that is on a par with the best-performing agricultural economies in the world. (See, for examples, comparisons in Fuglie, 2008.)

Figure 5. Trends in aggregate outputs and inputs used in agricultural production (1981=100)



Source: Fuglie, 2008.

Agricultural performance

49. Agricultural sector performance improved quickly in the wake of the policy reforms described above. Rice production, which stagnated during the latter part of the 1980s, has grown at an annual average rate of over 4% per year during the twenty years following the launching of the reform process. That pace of growth easily outstripped the growth in demand for domestic consumption permitting Vietnam’s rise from its net importer status to that of major exporter.

50. Coffee output growth was more spectacular, averaging nearly 18% per year over that twenty year period, lifting Vietnam from a minor role in the world market to that of a major player. Although, maize accounts for a much smaller share of the value of Vietnam’s total agricultural production there has been a sharp rise in production levels (growth averaging more than 10% per year) – an important development given the growing importance of this highly tradable commodity in international markets. Overall, Vietnam’s agricultural output as measured by FAO’s index has been growing at over 5% per year, a rate nearly double the rate of growth in Vietnam’s population.

Table 3. Production and productivity trends – selected commodities, 1988-2006

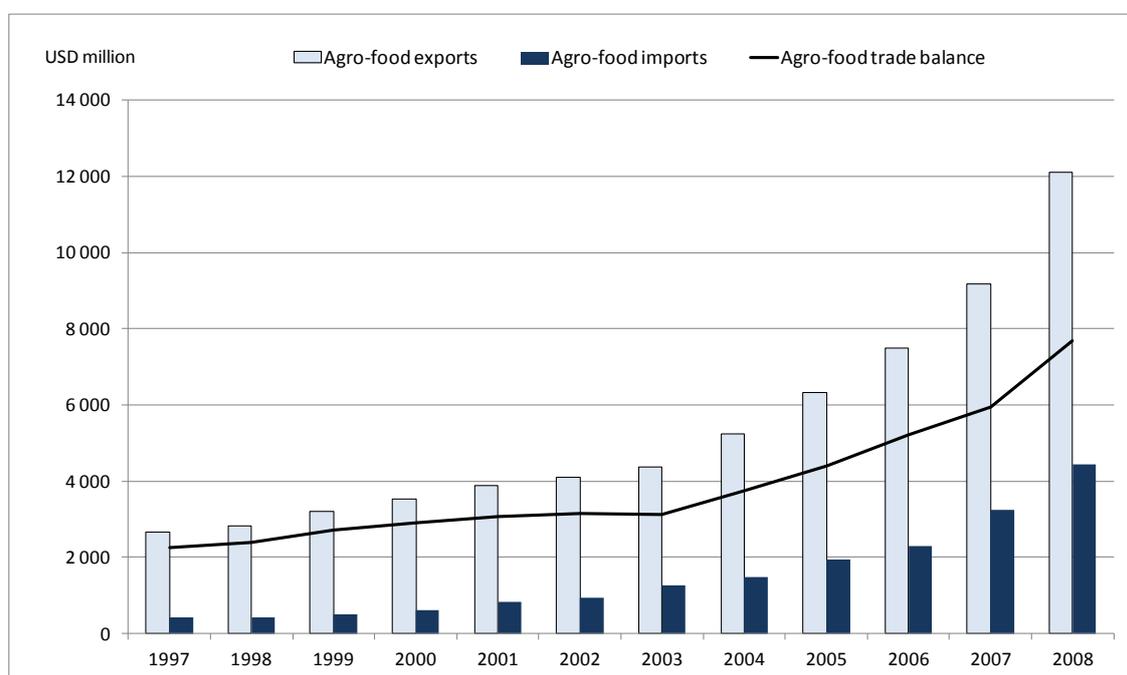
	Production	Area harvested	Total factor productivity	Labour productivity
Rice	4.2%	1.3%	3.5%	n/a
Coffee	17.8%	16.8%	n/a	n/a
Maize	10.8%	5.0%	n/a	n/a
Total Agriculture	5.3%	1.9%	2.7%	0.0%

Source: Production data from FAOSTAT (2010); Rice TFP from Kompas, *et al.* (2009); Labour productivity (Ag GDP/worker) from GSO (2010); Agriculture TFP from Fuglie (2008).

51. Expansion in land area explains almost all of the increase in coffee production and half that of increased maize production. Although most of the increase in rice production was due to increased productivity, there was a significant increase in area devoted to this crop as well. The overall increase in cropped area is quite high by OECD standards where there has been little increase in most countries and reductions in some during the past twenty-five years. Undoubtedly that expansion was partly due to the inducements to invest in land attributable in one way or another to the land reforms. Improvements in market access brought about by the market reforms and buoyant prices on world markets would have further boosted incentives to increase plantings.

52. Growth in the value of Vietnam's agricultural exports, driven largely but not exclusively by the sharply rising rice and coffee exports, has continued without pause into present times (Figure 6, see table A.1 in the annex for more details). While the value of agro food imports has also grown the gap between the two - the net trade balance has steadily widened.

Figure 6. Evolution of the agro-food trade in Vietnam



Source: UN Comtrade, 2010.

53. As analysis in the next section shows, an important source of Vietnam's success in reducing poverty came about because of increased farm incomes. Agricultural GDP/worker grew at an annual rate of 4% per year after 1988, a pace of increase considerably faster than that of economy-wide per capita

income. These gains were partly due both to an increase in agricultural value added in total and a stable or slowly declining number of people employed in sector (*i.e.*, increasing total incomes to be spread among fewer people).

3. Poverty in Vietnam

54. Vietnam's astonishingly rapid progress in reducing the national poverty rate is widely attributed to the economic growth triggered by the Doi Moi reforms. While most development economists accept that growth is essential in combating poverty (see for example, World Bank, 2008) there is long-standing concern that the growth process need not spread its benefits evenly geographically, sectorally or demographically. Some segments of society may gain more than others perhaps exacerbating an initially inequitable income distribution. This section discusses findings from in-depth analysis of microeconomic survey data addressing these dimensions.

What is poverty?

55. The Copenhagen Declaration issued at the UN's World Summit on Social Development in 1995, described poverty as "...a condition characterised by severe deprivation of basic human needs, including food, safe drinking water, sanitation facilities, health, shelter, education and information". While evocative as a description of the human condition of those suffering from poverty, such definitions do not provide a quantitative basis for tracking progress in reducing it (World Bank, 2005; Tuan, 2008; AusAID, 2002).

56. Working definitions of poverty are based on the notion of a poverty line. Generally, each country defines its own national poverty line based on the cost of a basket of goods necessary to cover basic needs. Basic needs typically mean enough food for adequate nutrition plus other essentials such as clothing and shelter. A person is considered poor if his or her actual consumption expenditure falls below that which is necessary to cover the cost of that basket of essentials. However, the definition of what is necessary to satisfy basic needs varies across time and societies. Therefore, poverty lines vary in time and place as each country uses lines which are appropriate to its level of development, societal norms and values (World Bank 2005; Tuan, 2008).

57. In the early 1990s the World Bank developed a way of measuring poverty using a common international definition. This definition splits poverty into two categories, food poverty and general poverty. The food poverty line is based on the World Health Organisation (WHO) standard average of 2 100 Kcal daily intake per capita. People whose consumption expenditures are lower than that required to achieve this minimum level are classified as food poor. The general poverty line is based upon the food poverty line but allows for minimum non-food basic consumption expenditures. The basket of goods that is used to calculate poverty lines is the same from year to year (but varies from country to country) with adjustments only made to the prices to estimate the expenditures required to purchase that basket.

58. To estimate consumption expenditures and consequently poverty rates, Living Standard Surveys are carried out systematically in developing countries. In measuring progress against the MDGs the Bank uses a reference line set at USD 1.25 (2005 Purchasing Power Parity terms). This corresponds to the mean of the national poverty lines for the 10-20 poorest countries of the world (Ravallion and Chen, 2008). Vietnam's General Statistic's Office (GSO) with technical assistance from the Bank tracks poverty developments using the USD 1.25 per day international standard and that is the poverty line we used in doing all of the analysis reported in this section. For analysis reported in the following section we used both the USD 1.25 line, also called the general poverty line, and the food poverty line.

59. In a separate activity, Vietnam's Ministry of Labour Invalids and Social Affairs (MOLISA) uses its own survey and definition of poverty to track poverty trends in the country to determine the level of

financial resources to be committed to its poverty reduction programs. The MOLISA poverty line is based on per capita income adjusted for regional differences and expressed in number of kilograms of rice. In terms of both level and trend it most closely resembles the GSO food poverty line, tracing almost exactly the same pace of decline from 1994 to 2005.

60. Data used to estimate consumption expenditures and consequently the GSO poverty rates, come from the Vietnam Living Standard Surveys (VHLSS) conducted in 1993, 1998, 2002, 2004 and 2006. Table 4 presents the levels of the two poverty lines for each of those survey years along with the number of households surveyed. These surveys provide data on a wide range of topics, including expenditures and incomes, education, health, fertility and nutrition, employment, migration, housing, agricultural activities, among others. These survey samples were selected to be representative of the national as well as regional levels (See more details in Annex Table A.3.)

Table 4. Food and general poverty lines, VND/Person/Year

Poverty	1993	1998	2002	2004	2006
General Poverty	1 160 000	1 790 000	1 917 000	2 077 000	2 560 000
Food Poverty	750 000	1 287 000	1 382 000	1 500 000	1 915 000
No. of households surveyed	4 800	6 000	29 530	9 189	9 189

Source: GSO, 2010. More details are presented in Annex Table A.4.

Poverty trends in Vietnam

61. The poverty headcount ratio is the proportion of the population living in households with consumption expenditures per capita falling below the poverty line. The headcount ratio is defined as:

$$H = \frac{1}{N} \sum_{i=1}^N I(y_i < z) = \frac{N_p}{N},$$

Where H is poverty headcount rate; N is total population; $I(.)$ is an indicator function that takes a value of 1 (poor) if the bracketed expression is true and 0 (non poor) otherwise; y_i is the expenditure and Z the poverty line.

62. Table 5 presents estimates of the headcount index of poverty, nationally and by region for each of the five survey years. (The information contained in this and all subsequent Tables and Figures were calculated from VHLSS survey data for all survey years 1993, 1998, 2002, 2004 and 2006, using the ADEPT interface of the World Bank Group).

63. Judging according to the general poverty rate, in 1993 58.1% of the entire Vietnamese population was in poverty; by 2006 only 15.9% were. The country had by 2002 already achieved the MDG of halving poverty, a goal whose achievement was slated for 2015.

Table 5. Poverty headcount rates (%) in Vietnam at national and regional levels

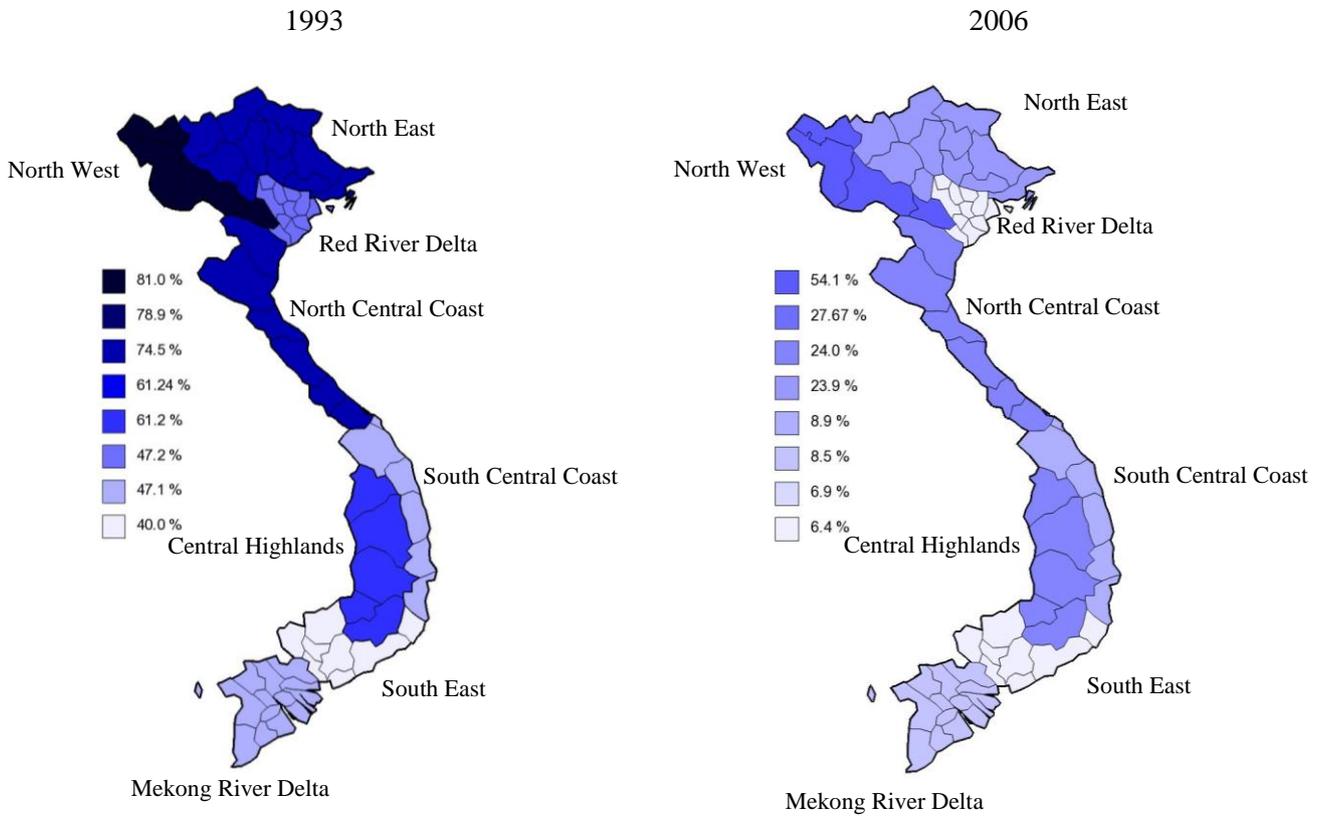
	1993	1998	2002	2004	2006
National	58.1	37.4	28.9	19.5	15.9
<i>Urban</i>	<i>24.9</i>	<i>9.2</i>	<i>6.7</i>	<i>3.6</i>	<i>3.6</i>
<i>Rural</i>	<i>66.4</i>	<i>45.5</i>	<i>35.6</i>	<i>25.0</i>	<i>19.8</i>
North West	81.0	73.4	68.0	58.6	54.1
Central Highlands	61.2	57.9	51.7	33.1	27.7
North Central Coast	74.5	48.1	43.9	31.9	24.0
North East	78.9	55.8	38.4	29.4	23.9
South Central Coast	47.2	34.5	25.2	19.0	8.9
Mekong River Delta	47.1	36.9	23.4	15.8	8.5
Red River Delta	61.2	28.7	22.5	12.1	6.9
South East	40.0	13.5	10.7	5.4	6.4

64. In Vietnam, as elsewhere in the developing world, both the incidence and the absolute number of people in poverty is higher in rural than in urban areas. In 1993 the urban poverty rate was 25% but rural poverty in that year was, at 66.4%, nearly two and one-half times that. By 2006, poverty in urban areas decreased to 3.6% and in rural areas to around 20%. These developments in percentage rates mask the underlying changes in numbers of people in poverty. Overall, the declining number of poor people nationally was overwhelmingly due to the reduction in rural poverty.

65. Poverty rates also vary quite substantially across regions. The North West, North East and Central Highlands have persistently shown higher poverty incidence than the rest of the country. Regions exhibiting the lowest poverty incidence are South East and Red River Delta in which the main cities of Ho Chi Minh and Hanoi are located respectively. Figure 7, shows the poverty incidence by regions for two years 1993 and 2006.

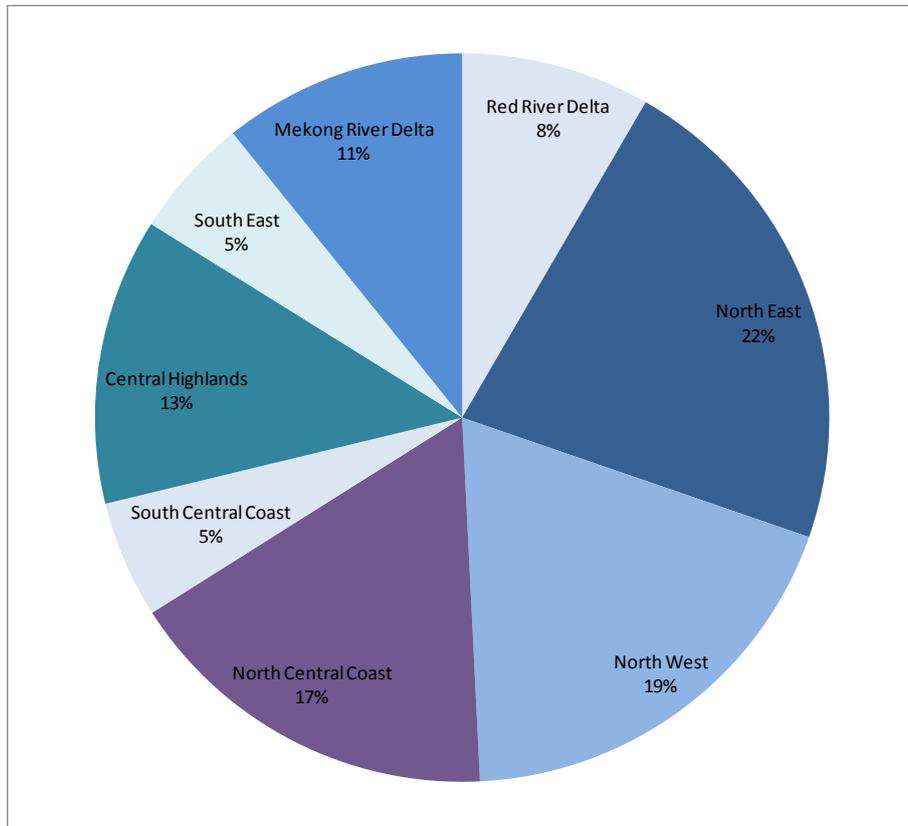
66. The North East, the Red River Delta and the North Central Coast regions achieved the fastest reductions in their poverty rates, each posting reductions of more than 50 percentage points from 1993 to 2006. The North West region succeeded in reducing its poverty by relatively modest 26.8 percentage points over those same years, leaving this region substantially poorer than the rest of the country. The high levels of poverty in the North West and in the North East, and Central Highland regions as well, reflects constraints they face in participating in the growth process due to a difficult physical environment limiting agricultural development and a restricted access to infrastructure, markets and social services (AusAID, 2002; World Bank, 2004).

Figure 7. Regional poverty rates for 1993 and 2006



67. Three regions account for almost 60% of Vietnam’s poor population, the North East with 22%, North West with 19% and North Central Coast with 17%. Even though the Central Highlands region is one of the poorest regions, it has a small population and so makes a small contribution to total poverty, the opposite situation is observed with Red River Delta and Mekong River Delta regions which have very low poverty rates, but high population densities (Figure 8).

Figure 8. Distribution of the poor in Vietnam in 2006



68. Figures 9 and 10 compare poverty rates between farm and non-farm households and then, for farm households, differences between those who own land and those who do not. Farm households are those that identified themselves as being self-employed and spend most of their work time on agricultural activities. In all survey years except 2002, farm households had a much higher rate of poverty. In 2002 there was only a small difference between poverty rates for farm versus non-farm households and could possibly reveal a problem with the data.

69. Poverty rates fell significantly both for those farm households with land and the landless. Interestingly however, in all surveys years the average poverty rates for landless households were lower than for those with land. Ravallion and van de Walle (2008) from their exhaustive study on land reform in Vietnam, highlight this result concluding that contrary to popular views, rising landlessness in Vietnam is a sign of progress in poverty reduction, as farm households take up new off-farm employment opportunities.

Figure 9. Poverty rates for farm and non-farm households

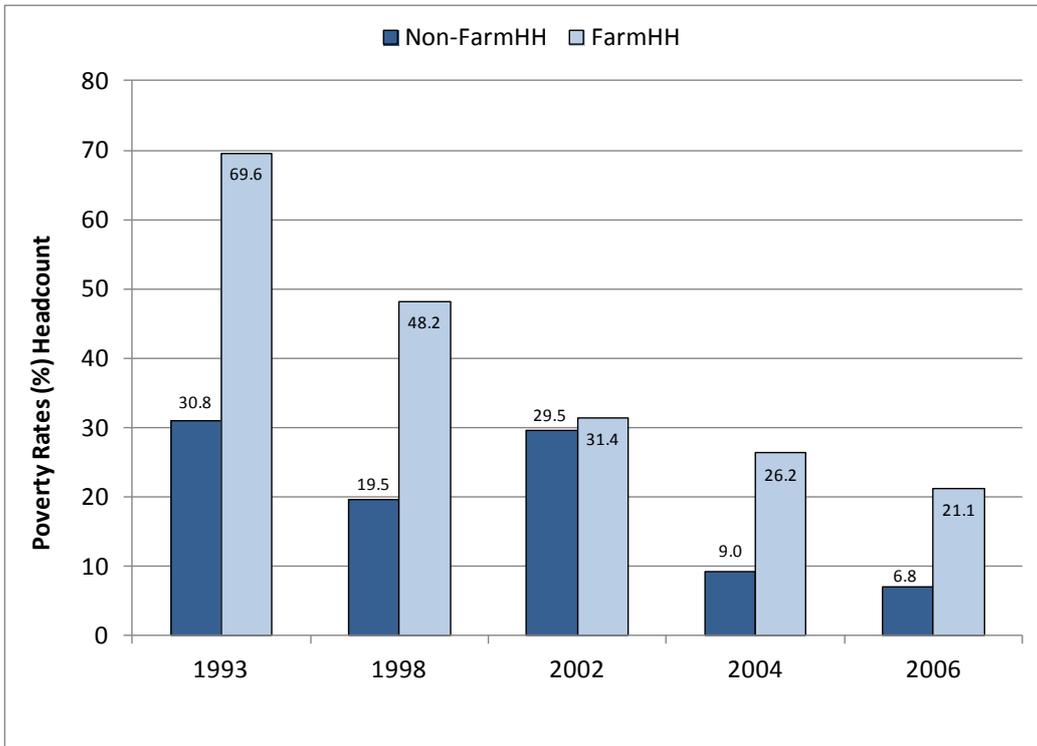
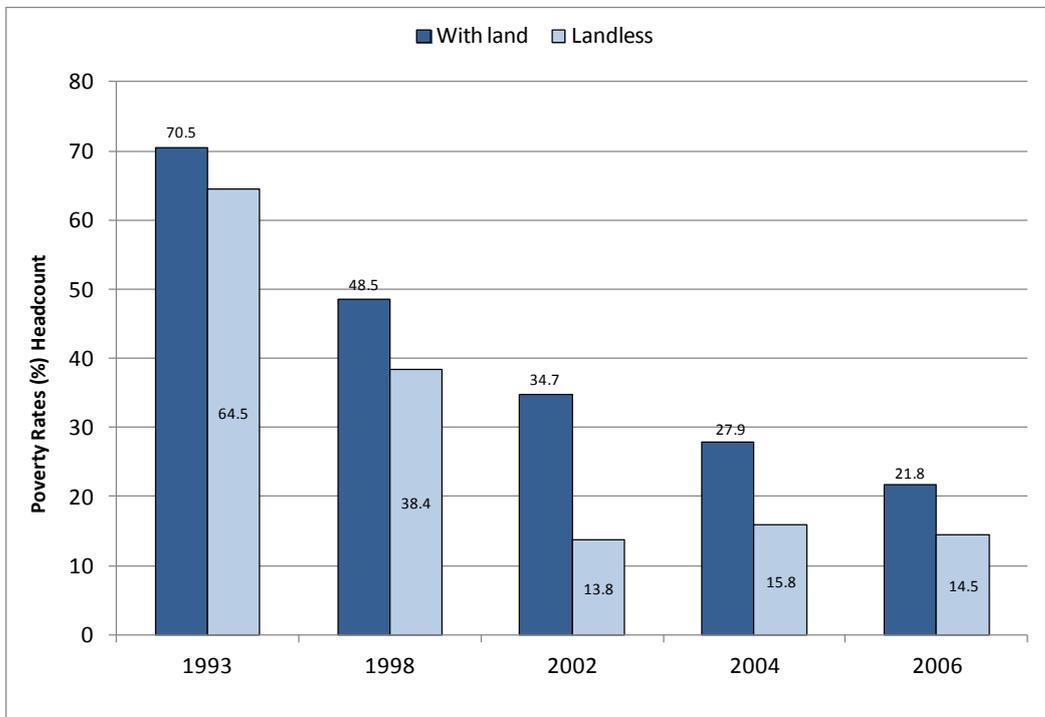


Figure 10. Evolution of poverty for landed and landless farm households



70. Improvements in education have proven in many countries to be an important way by which workers can improve their employment prospects and standard of living. Mook, Patrinos, and Venkataraman (1998) report estimated private rates of return to primary and university education in Vietnam of 13% and 11%, respectively. Glewwe, Gragnolati and Zaman (2000) find that an additional year of schooling of household heads raises household consumption per capita by around 3%.

Table 6. Proportion of heads of households with zero and 12 or more schooling years, 1993-2006

Survey year	Urban		Rural		Farm	
	Zero	12 or more	zero	12 or more	zero	12 or more
1993	8.3	19.4	13.7	7.5	13.8	6.3
1998	5.9	33	10.8	11.9	10.9	11.3
2002	6.9	29.9	11	9.8	8.3	15.1
2004	4.6	33.8	8.5	11.5	6.7	11.0
2006	4.1	35.6	9.2	11.1	7.3	10.5

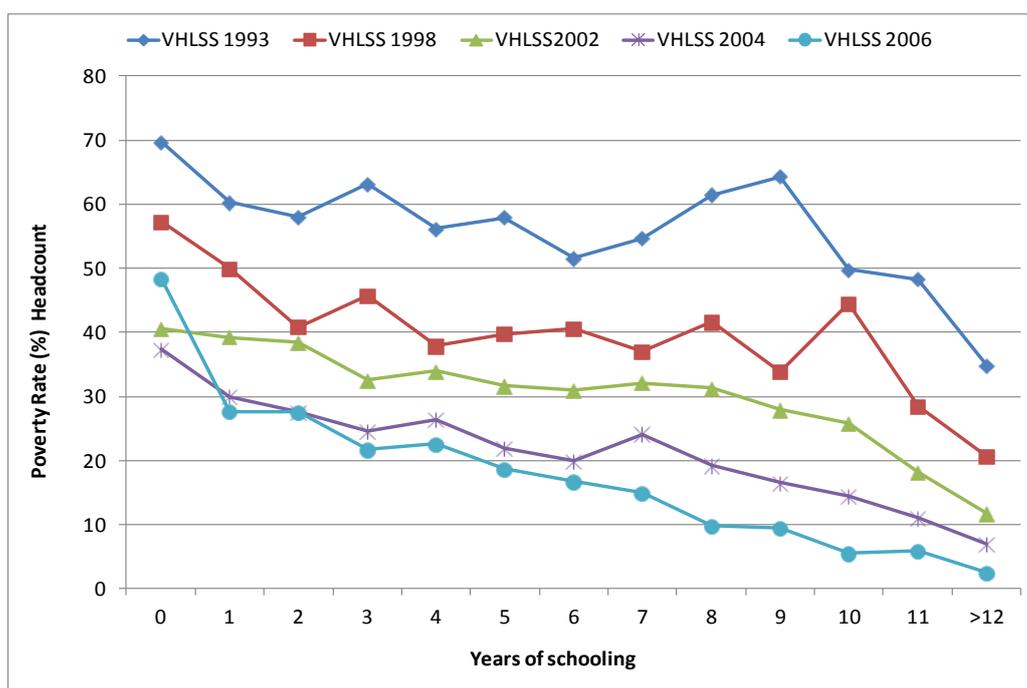
Note: See more details in Table A.5 in the annex.

71. Public spending on education in the country has steadily increased with the share of the budget spent on education increasing from 14.0% in 1994 to 18% in 2005, reaching over 5% of GDP, a spending level higher than the average of Asia (SRV, 2006). This investment seems to have paid off. Table 6 contains average literacy rates for the heads of urban, rural and farm households. These data show substantial reductions across all household categories in the proportion of the population having no education and a corresponding sharp increase in the proportion having twelve or more years of education.

72. Especially striking in the context of this study is the near halving of the proportion of farm household heads that was illiterate and a corresponding near doubling of the proportion having more than 12 years of education. Equally impressive is the near doubling of the proportion of highly educated amongst urban heads of household. Balisacan, Pernia and Estrada (2003) suggest that the economic opportunities created by Doi Moi could have strengthened the role of, and induced investment in, education.

73. Figure 11 plots the average poverty rates and the levels of education of the head of household for each of the five survey years, showing clearly both the fall in poverty rates the strongly negative relationship that was as important in 2006 as in 1993.

Figure 11. Poverty rates and levels of education in Vietnam



Other indicators of poverty

74. Though simple to construct and easy to understand, the poverty headcount index does have some shortcomings. In particular, it does not take into account the intensity or the depth of poverty. In other words, it does not indicate how poor the poor are, and hence does not change if people below the poverty line become poorer. An indicator which overcomes some of these problems is the poverty gap.

75. The poverty gap (PG) is defined as average difference between poor households' expenditure and the poverty threshold. The gap is considered to be zero for the non-poor, *i.e.*, those whose expenditures are greater than the poverty line. A closely related measure, the poverty gap index expresses the poverty gap as a percentage of the poverty line. The poverty gap index decreased from 18.5 in 1993 to 3.8 in 2006 for the total population (see Table 7). This suggests an outstanding improvement not only on the reduction of poverty as a whole (as we saw previously) but in the depth of poverty in the country.

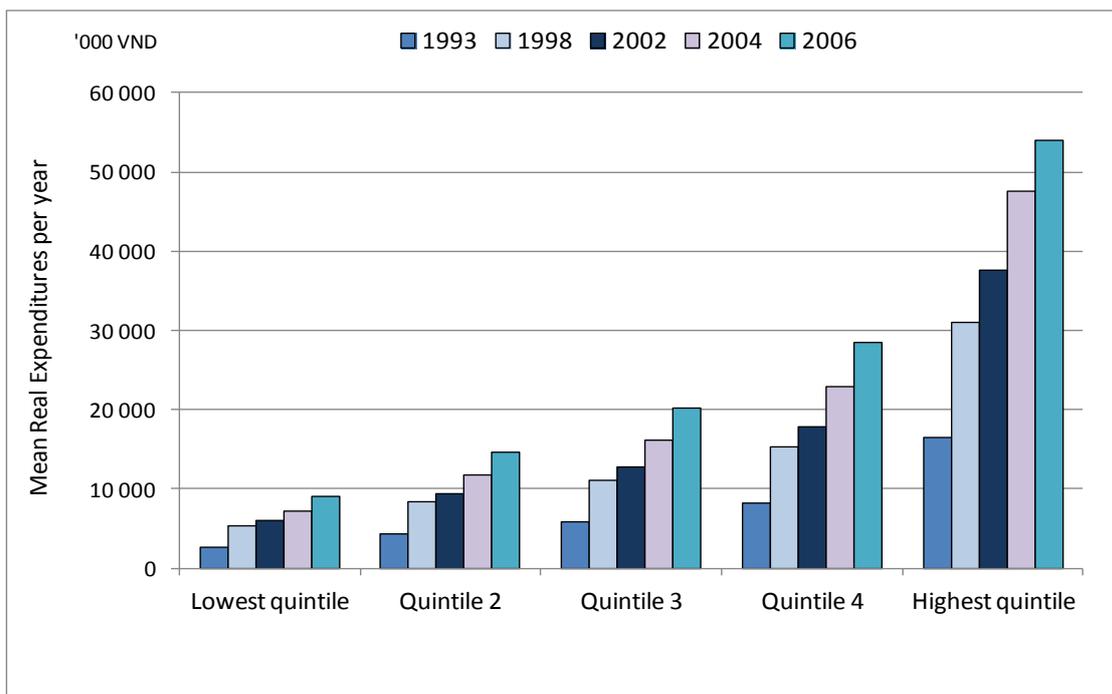
76. As the gap closes (tends to zero) it means that expenditures by the poor population are progressively closer to the poverty line *i.e.*, that poor people are becoming progressively less poor – a development that would not show up by looking only at the poverty headcount. The same pattern is observed in rural and urban population. Rural population had a PG index of 21.5 in 1993 and by 2006 the gap of only 4.8. For urban population the reduction was from 6.4 to 0.6 in the same period of time which suggests that there is a low depth in poverty and most of the poor people in urban areas are consuming almost about the poverty line.

Table 7. Poverty Gap Index

	1993	1998	2002	2004	2006
Total	18.5	9.5	7.0	4.7	3.8
Rural	21.5	11.8	8.7	6.1	4.8
Urban	6.4	1.7	1.3	0.7	0.6

77. Although the poverty head count and derivative measures such as the poverty gap constitute popular choices for poverty analysis some analysts, *e.g.*, Ligon and Sadoulet (2008), use estimated consumption expenditure data directly. Figure 12, presents the evolution of average real expenditures by quintile for each year of the survey data. Each quintile represents 20%, or one-fifth, of all households. All categories of households increased their consumption expenditures continuously over the survey years.

Figure 12. Trends in expenditures by quintile of the population, 1993-2006



Note: See more details of expenditures in Figure A.1. in the annex.

78. An interesting question to pose in this connection is whether those increases were uniform, *i.e.*, did the relatively rich, those in the top quintile, expand their consumption faster or slower than the relatively poor, those in the bottom quintile. Depending on the answer to that question, the expenditure, and presumably the underlying income distribution as well, would have worsened or improved. Balisacan, Pernia and Estrada (2003) examined provincial panel data collected in the 1993 and 1998 poverty surveys finding that those households who in 1993 were in the lowest expenditure quintile increased their spending faster than households in any other quintile. They conclude that Vietnam’s economic growth spurt over those years was decidedly ‘pro-poor’.

79. An indicator that helps to answer income distributional questions is the Gini coefficient - probably the most commonly used measure of income or wealth inequality. The Gini coefficient indicates how evenly the income (or wealth) is distributed throughout a country. Its value varies between 0, which reflects complete equality and 1 indicating complete inequality (one person has all the income or consumption, all others have none).

80. Developing countries have Gini coefficients that fall over a quite wide range, from *e.g.*, 0.30 for Ethiopia to 0.74 for Namibia (UNDP, 2009). Developed countries typically have relatively low Gini coefficients, averaging around 0.25 in, *e.g.*, Denmark, Japan and Sweden and around 0.40 in, *e.g.*, Portugal and the United States. It is common in many developing countries that as incomes grow, the income gap between the rich and poor widens and the Gini coefficient increases. In fast growing China for example the Gini coefficient increased from 0.3 in 1993 to 0.42 in 2007 (UNDP, 2009).

81. The Gini coefficients we estimated from the survey data for Vietnam (Table 8) show that the income distribution was relatively even to begin with – generally in the range of developed countries and did not deteriorate with rapid economic growth. In fact, if anything, the data suggest a slight improvement in the distribution of income over time. Household incomes average lower for rural than for urban households but are more evenly distributed, an outcome possibly associated with the egalitarian distribution of land rights achieved under the Doi Moi policy (Ravallion and van de Walle, 2008).

Table 8. Gini coefficients

	1993	1998	2002	2004	2006
Total	0.36	0.35	0.37	0.37	0.35
Urban	0.36	0.35	0.36	0.34	0.32
Rural	0.32	0.28	0.29	0.30	0.31

Note: See more details of 2006 Gini coefficient in Figure A.2 in the annex.

4. Agriculture’s contribution to poverty reduction in Vietnam

82. This section examines directly the main research question motivating our study of Vietnam – how important was agricultural progress for the country’s remarkable progress in reducing poverty. It is generally accepted that the only sustainable cure for poverty is economic growth and most empirical studies indeed find that poverty tends to fall with growth. But some kinds of growth reduce poverty more than others and many studies document that a given rate of growth can deliver diverse outcomes for the poor, suggesting that the pattern of growth (sectoral and/or geographical) matters independently of the overall growth.

83. Montalvo and Ravallion (2009) explain that if economic growth is very intense in sectors that do not benefit poor people then inequality will rise, holding back the gains to the poor. For example, if the poor live mostly in rural areas and depend mainly on agriculture for living, a booming high-tech sector in major metropolitan areas may not have much of an impact on poverty. Additionally, the initial distribution of income is known to be important for the subsequent effect of economic growth on poverty (Ravallion 1997; Bourguignon, 2003). When the poor have a low initial share of total income they will consequently have a lower share of the gains in aggregate income during the growth process.

84. Christiaensen and Demery (2007) emphasize the importance of the geographic pattern of growth. The contribution of economic growth to poverty reduction might differ across sectors because the benefits of growth might be easier for poor people to obtain if growth occurs where they are located. This reasoning implicitly assumes that transferring income generated in one economic sector or geographic location to another sector or location is difficult because of market segmentations or considerations of political economy. They find that growth originating in agriculture is on average significantly more poverty reducing than growth originating outside agriculture.

85. Montalvo and Ravallion (2009) find that the primary sector rather than the secondary or tertiary sectors was the real driving force in China’s spectacular success against absolute poverty. They conclude that the idea of a trade-off between these sectors in terms of overall progress against poverty in China is moot, given how little evidence they found of any poverty impact of non-primary sector growth.

86. Rural economic growth has been found to have more impact on poverty in India than urban economic growth. However, growth in the services sector has had more impact than the primary (agriculture) sector, while the secondary (manufacturing) sector appears to have brought little direct gain to India’s poor (Ravallion and Datt 1996, 2002; Datt and Ravallion, 2002).

87. While most empirical studies show that agricultural growth is relatively more important for poverty reduction than growth in other sectors, there are exceptions. This underscores the existence of potentially important differences in the sectoral GDP elasticities of poverty across countries depending on the structure and institutional organization of their economies (Loayza and Raddatz, 2006). A common finding is that the poverty reducing powers of agriculture declines as countries get richer (Christiaensen and Demery, 2007; Ligon and Sadoulet, 2008).

Method of analysis and data

88. Our approach follows closely that used by Montalvo and Ravallion (2009) in assessing the contribution to poverty reduction of the sectoral and geographic pattern of China's growth using provincial data. Here we construct a time series, cross-section dataset by aggregating survey results from the eight regions of Vietnam: 1-Red River Delta, 2-North East, 3-North West, 4-North Central Coast, 5-South Central Coast, 6-Central Highlands, 7-North East South, 8-Mekong River Delta. That dataset comprises regional averages for the general and food poverty lines and of household earnings per worker by category of employment (agriculture, services and industry) by region and for each survey year, 1993 to 2006. That is to say, for each variable in the dataset we have five years by eight regions or 40 observations. See dataset in Table A.6 of the annex. Note that in creating the income variables we counted only earnings from wages and self-employment in each of sectors respectively. This excludes other potential sources of incomes that could also help to reduce poverty such as rents, remittances, subsidies and other kinds of financial transfers to households.

89. Table 9 presents national averages and growth in earnings by source. These data reveal a pattern of earnings and of growth typical of successful developing economies in two important respects: 1) earnings per worker from agricultural sector are lower than those from non-agricultural sectors and 2) they grew faster. In 1993 earnings per worker from agriculture were just over one-third of the average of earnings per worker who made their living in the industry and services sectors. By 2006 earnings from agriculture were on average more than half that of the other two sectors. Though still large by developed country standards the gap between earnings from agricultural and non-agricultural seems to be closing rapidly. It is interesting to note in passing that the initially significant gap between earnings of workers in industry versus services had virtually disappeared by 2006.

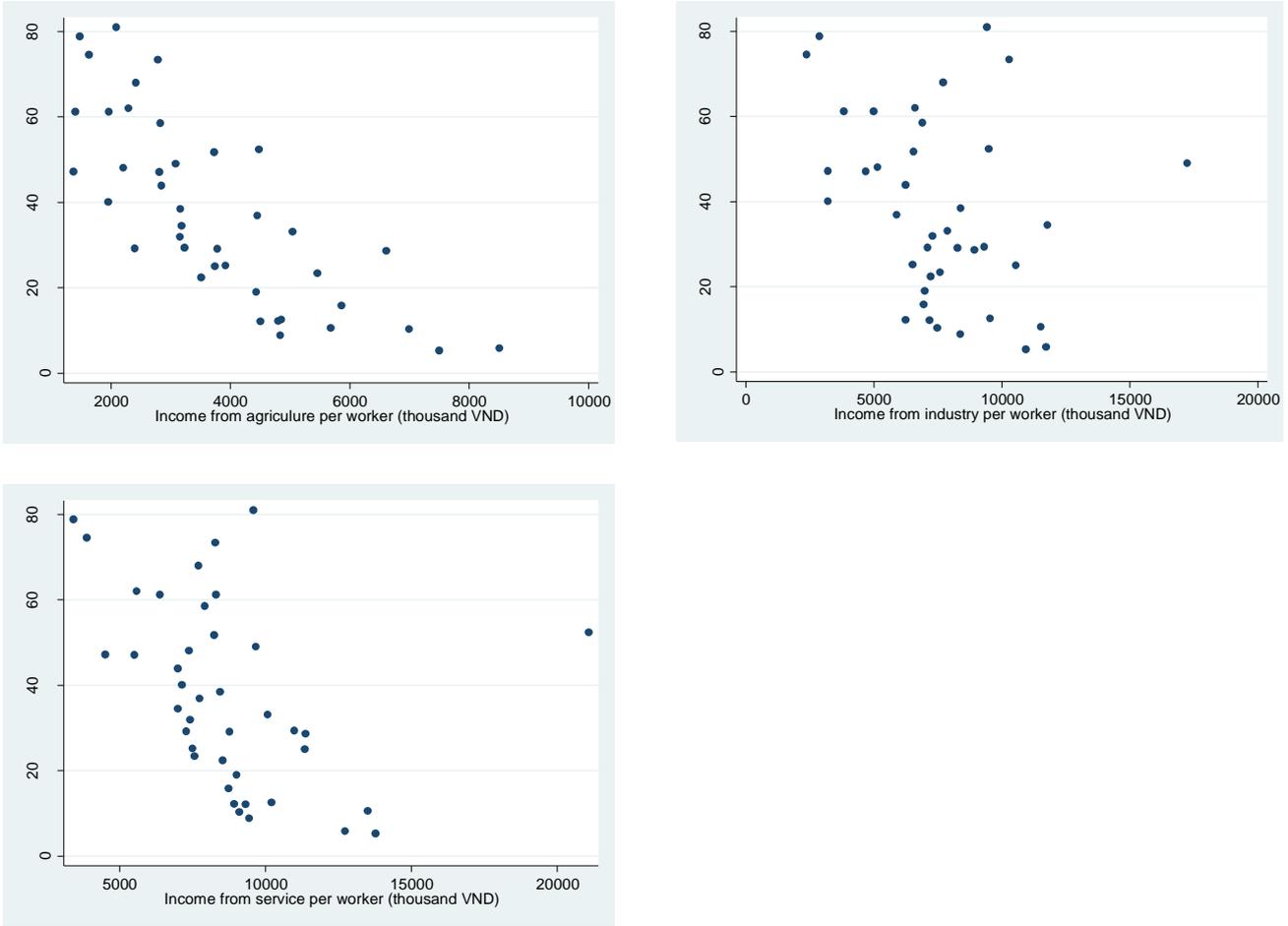
Table 9. Evolution of income per worker by source, '000 VND

	Agriculture	Industry	Services
000 VND/year			
VHLSS 1993	1 837	4 320	6 086
VHLSS 1998	3 324	7 818	9 154
VHLSS 2002	3 840	7 716	8 559
VHLSS 2004	4 568	7 928	9 653
VHLSS 2006	5 300	10 263	10 327
Growth (%)	8.5	6.9	4.2

Analysis

90. The three panels of Figure 13 exhibits plots of the time-series, cross-section observations for the general poverty rate (vertical axes) against the three earnings variables respectively (horizontal axes). Each dot in these figures pairs a year by region observation for the poverty rate and the associated earnings variable. These plots reveal the expected negative relationships between poverty and earnings from agriculture but the connection between poverty and earnings from the other two sources is much less apparent. However, more precise attribution requires regression analysis.

Figure 13. Poverty rates and earnings from sources



91. We estimate the regression coefficients linking poverty to earnings using the following variant of the model proposed by Montalvo and Ravallion (2009) to examine the effect of economic *structure on poverty*. The equation below constitutes our preferred specification:

$$P_{it} = \pi_{0i} + \sum_{j=1}^3 \pi_j \ln Y_{ijt} + \varepsilon_{it}$$

Where P_{it} is headcount rate of poverty for region i at the time t ; Y_{ijt} is per capita income from sector j of region i at time t . We estimated four separate versions of this specification: two using the general poverty rate as the dependent variable, one in which we controlled for fixed regional effects and one in which we did not. Then we repeated that pair of regressions using the food poverty rate as the dependent variable. We then estimated that same sequence of regressions using the logarithm of the poverty rates rather than the rates themselves as the dependent variables.

92. Results are in Tables 1 and 2. We tested for multicollinearity using the variance inflation factors (VIF) test. A VIF greater than 10.0 is generally seen as indicative of severe multicollinearity. In our case the VIF mean value of the three explanatory variables is 2.49, suggesting an absence of this problem.

93. The regression equations explain a relatively high percentage of variation in the time-series, cross-section poverty rate data. Regression results indicate that agriculture has been the most important earnings source for poverty reduction in Vietnam, and this applies to all eight regressions estimated, although the levels of significance vary according to the regression specification. Indeed, the only earnings variable to show statistical significance is agriculture, although the others are generally positive.

94. The OLS regressions or pooled regressions, present the highest levels of significance for agricultural earnings but at the sacrifice of some reductions in the R². However, the fixed-effects regressions that control for the regional effects also show earnings from agriculture as being significant.

Table 10. Regression results, semi-log functions

Independent variables	Dependent variable: headcount rate of general poverty		Dependent variable: headcount rates of food poverty	
	OLS	Fixed-effect	OLS	Fixed-effect
In agriculture earnings per worker	-42.37*** (6.79)	-24.90*** (5.62)	-23.22*** (4.16)	-6.99* (3.15)
In industry earnings per worker	6.30 (8.15)	-11.95 (10.06)	7.04 (5.53)	-8.01 (6.38)
In services earnings per worker	3.57 (13.52)	1.50 (15.76)	2.67 (9.73)	-1.72 (10.94)
Constant	294.05*** (72.78)	332.41*** (80.99)	119.44** (48.96)	160.52** (53.42)
Observations	40	40	40	40
R-squared	0.6507	0.7674	0.4973	0.6498

Notes: Robust standard errors in brackets * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 11. Regression results, log-log functions

Independent variables	Dependent variable: In headcount rate of general poverty		Dependent variable: In headcount rate of food poverty	
	OLS	Fixed-effect	OLS	Fixed-effect
In agriculture earnings per worker	-1.44*** (0.22)	-1.08** (0.32)	-1.85*** (0.30)	-1.09* (0.46)
In industry earnings per worker	0.23 (0.20)	-0.20 (0.32)	0.47 (0.30)	-0.28 (0.46)
In services earnings per worker	0.10 (0.44)	0.22 (0.32)	0.20 (0.64)	0.16 (0.51)
Constant	12.10*** (2.25)	11.90*** (1.61)	11.58*** (3.14)	12.41*** (2.44)
Observations	40	40	40	40
R-squared	0.6656	0.7703	0.5699	0.6759

Notes: Robust standard errors in brackets * significant at 10%; ** significant at 5%; *** significant at 1%.

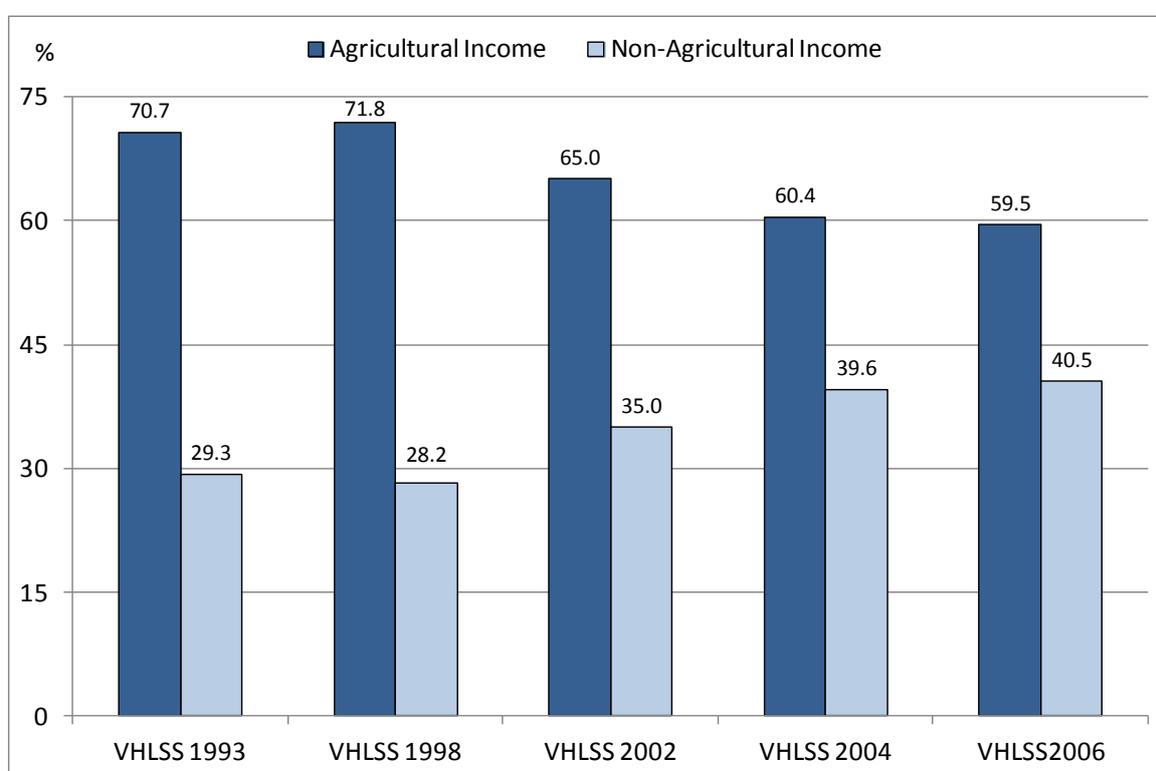
95. The coefficients of log-log regression can be interpreted as elasticities (Table 11). For instance, in the first OLS regression we have that an increment of one per cent in agricultural earnings will decrease poverty rates by 1.4% (not percentage points), ceteris paribus. The same kind of interpretation holds for the other three specifications.

96. The general finding that neither industry nor services earnings were statistically significant contributors to poverty reduction in Vietnam echoes similar findings for China in the Montalvo and Ravallion (2009) study. Care must be taken however in reading too much into this finding. As noted

elsewhere in the report, the number of people employed in agriculture has been declining, not only as a share of total employment but also in absolute numbers of workers.

97. Moreover, as the data plotted in Figure 14 show, farm households in Vietnam are increasingly diversifying their income sources with an increasing share coming from off-farm sources. In 1993 farm sourced income accounted for over 70% of total incomes of farm households. By 2006, that proportion had fallen to under 60%. Both migration to off-farm jobs and the increasing diversification of income sources are consequences of farm people responding to the attraction of higher paying work off the farm. This pull of higher paying off-farm jobs reduces the supply of workers and puts upward pressure on their earnings rates in agriculture. Do we attribute this development to growth in agriculture or in other sectors? Be that as it may, it seems clear that growth in agricultural earnings per worker are the overwhelmingly most important proximate if not underlying cause of the poverty reduction observed in Vietnam.

Figure 14. Evolution of farm household income by source



5. Conclusions and implications

98. Vietnam's economic recovery since the late 1980s lifted nearly one-half the population from below to above the international dollar a day poverty line. The country which could not produce enough rice to feed its own population in those years is now a major supplier to world markets. Sustained growth boosted the incomes of workers in all economic sectors and geographic regions, with no apparent deterioration in the distribution of incomes. In less than two decades, the country transformed itself from a closed, centrally-planned and failing economy to an open, widely successful market economy. Although still a poor country, the pace and breadth of Vietnam's economic achievements over the past two decades is virtually unmatched elsewhere in the developing world.

99. Credit for Vietnam's economic success is widely attributed to a package of policy reforms that appear remarkably similar to "free market" policy prescriptions generally associated with the International Monetary Fund, the World Bank and the OECD. These include macroeconomic stabilisation, privatization of state owned enterprises, deregulation of markets, reduction of barriers to internal and external trade, and so on. However, in sharp contrast with many other countries implementing those policy prescriptions, Vietnam did so independently of the 'conditionality' provisions for access to grants and loans imposed by the international financial institutions.

100. At the core of Doi Moi policy was a total makeover of agricultural policy. In effect, the government changed its mind about what constituted appropriate policy for the sector. Individual farmers were granted rights to land and other assets that formerly belonged to the state-controlled cooperatives. Regulations limiting farmer access to internal and external markets were lifted, boosting demand and prices received. Unprofitable state-run marketing and input supply organizations were shut down and efficiency gains achieved by the private firms that replaced them showed up in both higher effective output prices and lower input costs. While cutting back on budgetary expenditures elsewhere the government substantially ramped up investments in agricultural research and technology transfer.

101. Of course, developments in these factors did not occur independently of each other or of other important changes in the economic environment within which farm households make decisions. For example, part of the gains in total factor productivity achieved in rice was induced by improvements in market conditions sparked by the policy reforms. The land reforms not only spurred increased output, productivity and farm incomes but also freed some workers to sell or rent their land in order to take higher paying jobs off the farm. Production enhancing technical change fostered by government investments in agricultural research and development would not have paid off so well; indeed could have been counter-productive except for improvements in market access that came with relaxation of administrative barriers restricting trade.

102. Thus the proper perspective in evaluating the reforms should be the same as the government took in implementing them – that is, to view them as a package. That package surely contributed substantially to Vietnam's achievements in reducing poverty. The main reason poverty rates fell was increased earnings of agricultural workers. It seems impossible that poverty in other countries in the developing world can be alleviated except through increasing the incomes of those who depend on agriculture for a living. Here again however we run the risk of single factor attribution. Growth in agricultural incomes may explain poverty reduction but multiple factors explain that growth.

103. Agricultural policy today bears little resemblance to that of twenty years ago. But the change did not occur overnight. The overall process was deliberate and gradual. There were, for example, major changes to the laws governing land tenure in 1988, 1993, 1998 and 2003, gradually transitioning from a system of collective ownership to one of near complete private ownership of the rights to use land by individual farmers. That same deliberateness characterizes the near complete but progressive liberalization of the rice market.

104. The government of Vietnam changed, and quite dramatically, its role in the agriculture sector. But it did not abandon agriculture. The focus now is more squarely on provision of public goods that enable the private sector, of which farmers are the most important agents, to flourish. This is clear from the sharply rising trends in public investments in agricultural research.

105. Few countries in the world, developing or developed, posted improvements in agricultural productivity at a pace as fast as Vietnam over the past twenty years. Some credit goes to that highly laudable increase in public investments in agricultural research. But, the payoff to such investments is typically only in the medium to long term. Moreover, even though growing rapidly, those investments still

constitute only a tiny share of sector GDP. There must have been some other factor at play. The likely candidate seems to be induced innovation. That is, the reason farmers were able to so rapidly increase their productivity must have been by applying improved techniques of production already on the shelf.

106. What are the policy lessons from Vietnam's success? There are numerous countries in the developing world where agriculture's potential is thwarted by inappropriate agricultural policy. Yet, it is easy to find examples where the same policy prescriptions that were so fruitfully applied in Vietnam failed to deliver. What makes Vietnam different? That mystery justifies more effort to solve than could be devoted to it here. However some characteristics of the Vietnam experience stand out. Much credit goes to the evident fairness of the reforms. Equity considerations seemingly trumped efficiency concerns. While radical, the phasing in of the reforms help to assure political buy in, reinforcing the perceptions of fairness of the process. These characteristics may help to explain much of the rare achievement embodied in rapid economic growth with no or with positive income distributional outcomes.

ANNEX

Table A.1. Exports and imports in Vietnam, USD 000

	1997	1998	1999	2000	2001	2002
Agro-food exports	2 674	2 812	3 208	3 534	3 896	4090
Agro-food imports	426	430	502	624	820	929
Agro-food trade balance	2 249	2 382	2 706	2 910	3 076	3 161
Total exports	9 184	9 357	11 537	14 476	15 029	16 705
Total imports	11 565	11 625	11 735	15 629	16 218	19 732
Share of agro-food in total exports (%)	29	30	28	24	26	24
Share of agro-food in total imports (%)	4	4	4	4	5	5
Rice exports	871	1 020	1 025	668	624	726
Coffee exports	498	594	587	502	394	329
Share of rice in total agro-food exports (%)	33	36	32	19	16	18
Share of coffee and tea in total agro-food exports (%)	19	21	18	14	10	8
	2003	2004	2005	2006	2007	2008
Agro-food exports	4 381	5 239	6 330	7 489	9 186	12 115
Agro-food imports	1 254	1 486	1 945	2 284	3 240	4 441
Agro-food trade balance	3 127	3 753	4 385	5 205	5 946	7 674
Total exports	20 145	26 482	32 442	39 819	48 544	62 324
Total imports	25 075	31 402	35 941	43 012	61 449	77 986
Share of agro-food in total exports (%)	22	20	20	19	19	19
Share of agro-food in total imports (%)	5	5	5	5	5	6
Rice exports	720	950	1 408	1 276	1 490	2 896
Coffee exports	509	648	750	1 230	1 927	2 132
Share of rice in total agro-food exports (%)	16	18	22	17	16	24
Share of coffee and tea in total agro-food exports (%)	12	12	12	16	21	18

Source: UN Comtrade, 2010.

Table A.2. Vietnam Living Standard Surveys (VLSSs) and Vietnam Household Living Standard Survey (VHLSSs)

VLSS 1993	Vietnam Living Standard Survey (VLSS) 1993. This survey was undertaken from October 1992-October 1993, with technical support from the World Bank. It applied a multistage cluster sampling procedure on two strata (rural and urban areas) to select a nationally and regionally representative sample of 4 800 households with 23 839 individuals. The main topics are household income and expenditure, housing, education, health, employment, agricultural activities, non-farm business activities, migration, fertility, savings and credit, basic economic infrastructure, and social services. The survey use three types of questionnaire: a household questionnaire, a community questionnaire and a price questionnaire which write the exact questions to be asked in order to ensure that each question was understood in the same way by interviewers and respondents. The data collection method consisted of face-to-face interviews.
VLSS 1998	This survey started in December 1997, completed in November 1998. It followed the same format and organisation of VLSS 1993. It used a multistage cluster sampling procedure for a sample of 6 000 households with 28 509 individuals. Representative at national, urban and rural and regional levels.
VHLSS 2002	Vietnam Household Living Standard Survey (VHLSS). It was carried out during the whole year of 2002. VHLSS 2002 incorporates many aspects of the VLSS 1993 and VLSS 1998 as well as many characteristics of the Multi-purpose Household Survey (MPHS). Topics covered were: Basic demographic information on all household members (age, sex, relationship to head); household expenditures (food, education, health, etc.); household income (wages and salary, farm production, non-farm production; remittances, etc.); employment and labour force participation; education (literacy, highest diploma, fee exemption); health (use of health services, health insurance); housing (type of housing, electricity, water source, toilet, etc.); assets and durable goods; participation in poverty programs; information on local infrastructure collected by a community questionnaire. The survey sample was 75 000 households, but only 30 000 households with complete information, representative at national and regional levels.
VHLSS 2004 VHLSS 2006	The VHLSS 2004 and VHLSS 2006 used 2 types of questionnaire to collect information. The household questionnaire (for Income and Expenditure sample) includes about 400 questions on 10 different topics: demographic characteristics; education and vocational training; health and health care; income; expenditure; fixed assets and consumer durables; housing, water and sanitation; participation in the poverty alleviation and hunger eradication programme and credit; agriculture, forestry and aquaculture (expanded); and business other than agriculture, forestry and aquaculture (expanded). The commune questionnaire consists of 10 sections: survey information; demographic characteristics and general situation of the commune; general economic status and assistance programmes; opportunity for non-farm employment; agriculture and land; infrastructure; education; health; public security and social issues; credit and saving. The sample for the income and expenditure survey covering all 10 sections of the questionnaire consists of 9 189 households and is representative of the whole country, urban, rural and 8 regions.

Source: GSO, 1993, 1998, 2002, 2004, 2006.

Table A.3. General characteristics of the households

	VHLSS 1993	VHLSS 1998	VHLSS 2002	VHLSS 2004	VHLSS 2006
Age of head of household (years)	45	48	48	49	49
Household size (No. of people per family)	5.0	4.8	4.5	4.4	4.3

Table A.4. Land size structure in 2006

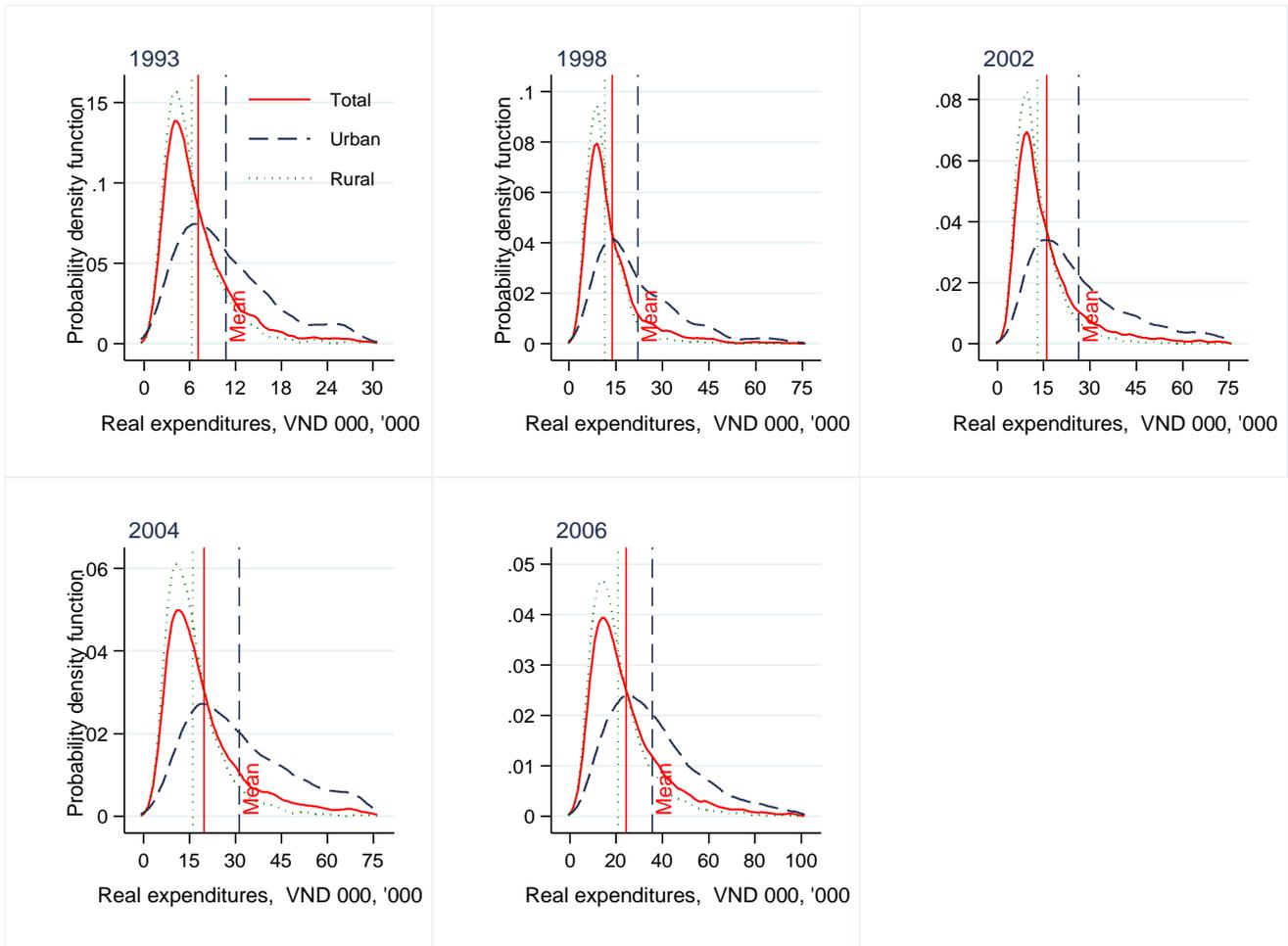
2006	<0.2 ha	0.2-0.5 ha	0.5-2 ha	>2 ha	Total
No. of households by agricultural production land size	3 753 454	4 259 744	2 956 742	683 538	11 653 478
Percentage	32%	37%	25%	6%	
No. of households by paddy production land size	4 398 933	3 436 289	1 266 347	228 921	9 330 490
Percentage	47%	37%	14%	2%	

Source: Agricultural Census 2006.

Table A.5. Percentage of households with different years of schooling, by survey year

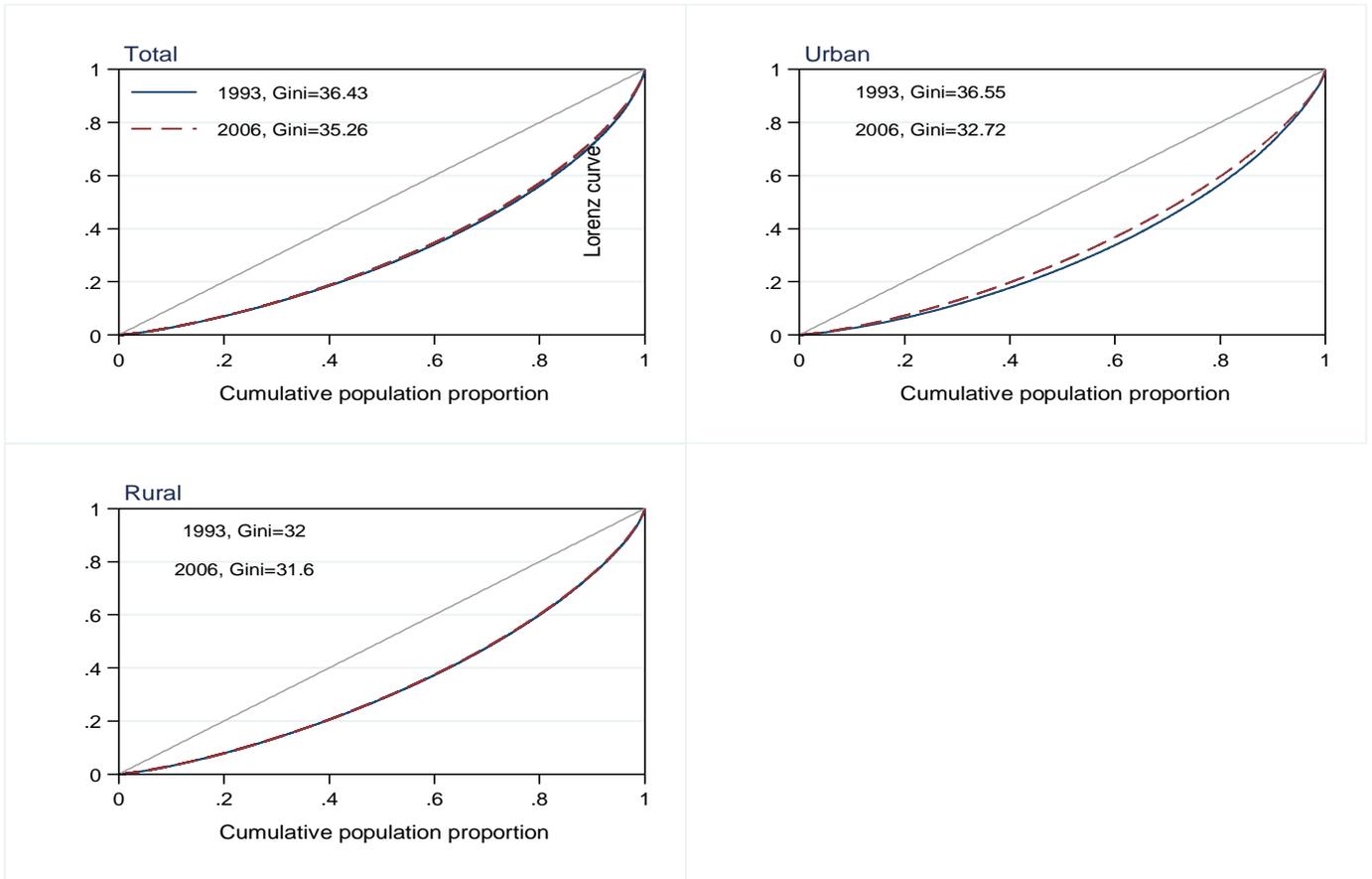
Schooling years	VHLSS 1993	VHLSS 1998	VHLSS 2002	VHLSS 2004	VHLSS 2006
<i>Rural households</i>					
0	13.7	10.8	11.0	8.5	9.2
1	2.4	1.5	2.4	2.1	1.7
2	6.0	5.8	6.0	6.0	5.0
3	8.9	8.6	7.2	7.8	7.1
4	7.5	7.4	7.9	7.1	7.2
5	12.7	14.0	11.0	11.4	12.0
6	5.3	4.9	6.7	6.1	5.9
7	4.1	4.0	7.2	6.0	5.6
8	5.0	3.9	3.9	4.4	4.4
9	22.1	18.3	22.9	24.8	26.3
10	2.1	6.1	2.3	2.5	2.4
11	2.8	2.8	1.8	1.8	1.9
>=12	7.5	11.9	9.8	11.5	11.1
<i>Urban households</i>					
Schooling years	VHLSS 1993	VHLSS 1998	VHLSS 2002	VHLSS 2004	VHLSS 2006
0	8.3	5.9	6.9	4.6	4.1
1	1.5	1.0	1.4	1.3	1.0
2	4.4	4.1	2.8	3.7	3.3
3	6.2	5.6	4.5	4.9	4.4
4	5.6	4.4	4.7	5.0	4.1
5	10.4	9.8	8.4	9.2	7.9
6	7.7	4.6	5.5	4.8	4.9
7	5.0	3.9	6.1	3.9	4.3
8	4.2	3.8	3.4	3.0	3.8
9	19.0	15.7	19.4	19.1	19.6
10	3.5	4.7	4.3	3.5	3.8
11	4.9	3.4	2.8	3.3	3.3
>=12	19.4	33.0	29.9	33.8	35.6

Figure A.1. Changes in level of expenditures various years in Vietnam



Source: VHLSS 1993, 1998, 2002, 2004, 2006.

Figure A.2. Gini-coefficient in total, urban and rural areas in Vietnam



Source: VHLSS 1993, 1998, 2002, 2004, 2006.

Table A.6. Dataset used in regressions

Regions	Year	Agriculture Income	Industry Income	Services Income	General Poverty Rate	Food Poverty Rate
1	1993	1 967.79	3 823.38	8 297.78	61.24	25.02
1	1998	2 398.06	7 097.62	7 284.13	29.27	8.45
1	2002	3 511.21	7 214.17	8 532.47	22.44	5.31
1	2004	4 503.97	7 172.18	9 309.33	12.14	2.33
1	2006	4 835.05	8 372.80	9 438.87	8.82	2.07
2	1993	1 476.57	2 875.93	3 414.30	78.86	37.95
2	1998	2 290.66	6 607.52	5 583.37	62.04	30.93
2	2002	3 164.36	8 393.82	8 436.83	38.43	15.43
2	2004	3 231.51	9 310.47	10 993.73	29.38	11.38
2	2006	3 736.95	10 541.78	11 345.70	25.02	9.46
3	1993	2 091.53	9 414.84	9 583.22	80.98	35.66
3	1998	2 785.62	10 294.93	8 270.42	73.35	38.46
3	2002	2 414.88	7 707.95	7 698.02	68.03	46.07
3	2004	2 825.73	6 901.68	7 920.10	58.57	34.77
3	2006	3 079.66	17 251.77	9 666.38	49.05	29.87
4	1993	1 628.67	2 377.08	3 864.03	74.54	35.51
4	1998	2 207.30	5 145.15	7 368.37	48.09	19.02
4	2002	2 846.08	6 240.18	6 997.05	43.90	17.50
4	2004	3 153.52	7 293.01	7 410.61	31.90	13.57
4	2006	3 782.16	8 263.69	8 770.53	29.12	14.31
5	1993	1 369.99	3 207.44	4 506.51	47.20	22.76
5	1998	3 182.42	11 789.92	6 994.25	34.46	15.87
5	2002	3 919.57	6 515.55	7 505.30	25.15	8.96
5	2004	4 436.22	6 982.39	9 003.87	19.01	8.13
5	2006	4 852.40	9 544.44	10 202.35	12.57	4.84
6	1993	1 402.69	4 979.16	6 378.41	61.23	27.54
6	1998	4 477.16	9 485.82	21 074.00	52.40	31.48
6	2002	3 727.75	6 548.35	8 236.18	51.76	29.53
6	2004	5 042.54	7 877.42	10 082.55	33.12	18.79
6	2006	6 609.63	8 927.53	11 366.26	28.64	16.40
7	1993	1 954.65	3 204.38	7 134.32	40.04	13.47
7	1998	4 798.35	6 230.35	8 919.43	12.19	4.98
7	2002	5 680.11	11 529.84	13 504.13	10.54	3.00
7	2004	7 495.82	10 943.38	13 766.04	5.37	1.46
7	2006	8 505.07	11 726.67	12 729.56	5.83	2.32
8	1993	2 806.40	4 681.80	5 510.23	47.10	17.66
8	1998	4 452.10	5 890.89	7 737.27	36.92	11.25
8	2002	5 456.68	7 581.12	7 564.16	23.37	6.46
8	2004	5 857.75	6 943.45	8 737.10	15.85	3.95
8	2006	6 995.79	7 474.45	9 099.13	10.30	2.70

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