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Poverty Reduction and Economic Growth In Southeast Asia

*Peter Warr**
Australian National University Canberra, Australia

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Abstract

Since the 1970s, the majority of Southeast Asian countries have achieved both rapid economic growth per person and large reductions in the incidence of poverty. This study focuses on the relationship between these two phenomena within the Southeast Asian economies, controlling for both the relative price of food and the sectoral composition of the growth. Among other issues the paper explores whether the relative price of food and the sectoral composition of economic growth – including agriculture, industry and services – are relevant in terms of the rate of poverty reduction, given the overall rate of economic growth. The results confirm both the relevance of relative prices and the fact that poverty reduction is strongly related to the growth of real GDP per person. The sectoral composition of the growth is also important, especially in so far as it affects the expansion of the agricultural sector relative to the rest of the economy. The results confirm that growth based on the expansion of this sector contributes more strongly to poverty than growth arising from industry or services.

Keywords: Poverty incidence; economic growth; rural poverty; urban poverty
JEL Classifications: O15, D3

*Address: CBE Building 26C, Kingsley St.Acton, ACT, 2601 Australia. Email: Peter.Warr@anu.edu.au

1. Introduction

What drives poverty reduction? How important is economic expansion and what kinds of such expansion are most effective? One form this debate has taken concerns whether the poverty-reducing propensity of economic growth depends on its sectoral composition – whether it occurs in the agricultural, industrial or services sectors of the economy. The countries of Southeast Asia reflect these issues very well. Over recent decades these nations have each experienced considerable fluctuations in both growth rates (aggregate and sectoral) and poverty reduction outcomes. In all these countries, whether economic growth does or does not deliver sustained reductions in poverty incidence, and what kinds of growth reduce poverty the most, are questions of ongoing policy debate.

A related policy debate concerns the effect that changes in relative prices have on poverty, particularly the real price of food. Some Southeast Asian governments have protected their agricultural sectors, thereby raising the real price of food, ostensibly because higher food prices benefit poor farmers. Indonesia, the Philippines, and more recently Thailand, are examples. But changes in relative prices produce both gainers and losers and both groups will include some poor people. Poor farmers who are net sellers of food will indeed benefit if real food prices increase. But poor consumers will lose and this group includes not only the urban poor, but many rural poor people as well, especially landless agricultural workers who sell labor and buy food. Small farmers who are net buyers of food will also be harmed. The net effect of these two opposing sets of forces – producing gainers and losers – is not obvious.

Several Southeast Asian economies enjoyed a series of economic booms from the late 1980s until 1996 and the countries that experienced this rapid growth uniformly made considerable progress in reducing poverty. However, in the late 1990s most of these same countries were affected by the Asian Financial Crisis and experienced deep recessions. Economic hardship was felt by workers at all levels of income, but the implications for the poorest people were of particular concern. Macroeconomic recovery has subsequently occurred in all of these countries, but at varying rates and with varying outcomes for poverty incidence. Attention has thus been re-focused on the variables that drive changes in the rate of poverty.

In the post-crisis environment, restoration of economic growth is a policy priority in all Southeast Asian countries, but not just any growth (Bourguignon 2001). Reflection on the boom period, the crisis that followed it and the subsequent recovery has convinced many policy makers and independent observers that the quality of growth is important and not just the rate. But what is "quality" growth? One criterion for determining the quality of growth, though certainly not the only one, is its effects on the poor. (Fields 1980) What kinds of growth are most (and least) beneficial for the poor? Much of the development economics literature has dealt with the manner in which the distribution of income is affected by the rate and composition of economic growth. This paper explores

some of these issues in the context of Southeast Asia. In particular, it asks how the absolute poverty incidence changes with economic growth and to what extent these effects depend on the characteristics of the growth, such as its sectoral composition, and changes in the relative price of food.

The analysis focuses on the eight poorest countries of Southeast Asia, all of which were affected by the 1997-99 financial and economic crisis. The four most deeply affected were Thailand, the first to succumb; Indonesia, the most severely harmed; Malaysia, where the crisis produced the most radical macroeconomic policy responses; and the Philippines, where the pre-crisis boom was least pronounced, but where the crisis itself was nevertheless significant. The four less affected, but still very poor countries constituted Cambodia, Laos, Myanmar and Vietnam.[1] The two richest ASEAN countries, Brunei and Singapore, are not covered in this study because their recorded levels of poverty incidence are very low. Myanmar is necessarily excluded from the quantitative analysis because, at least until recently, its national accounts data is considered unreliable. Finally, Cambodia was also excluded from the quantitative analysis because data on sectoral growth rates were unavailable.

The six remaining ASEAN countries were chosen for the quantitative analysis of this study because for all six poverty incidence is a serious policy concern and because data on poverty incidence and economic growth is available, covering a significant time period. Nevertheless, the intervals between available data points vary and are often several years long. This means that the total number of data points on changes in poverty incidence over time that are available for any one of these countries is small and statistical analysis of the relationship between poverty incidence and economic growth is highly problematic for any one of them, taken individually. Nontheless, analysis of this kind becomes feasible when the data is appropriately pooled across countries.

There are reasons for thinking that pooling data for this particular group of six countries is reasonable. First, these counties have roughly similar economic structures. All are market-oriented economies with large agricultural sectors consisting primarily of small farming units. Agriculture dominates total employment, but not national output. In all of these countries, industrial production has combined export-oriented manufacturing with protected production for domestic markets. All have large services sectors providing residual employment opportunities for those not employed in agriculture or industry. Rural populations dominate the total numbers of poor people in each economy, but rural to urban migration has been a prominent feature of the long-term development process. These facts suggest that the underlying relationship between sectoral growth and poverty reduction might be similar among these six countries, whereas this may not apply among nations whose structural features differ widely.

[1] They were less affected than the first four countries because pre-crisis levels of short-term capital inflows had been much smaller and they were therefore less vulnerable to a sudden capital outflow (Warr 2003).

Second, despite their structural similarities these nations have different economic histories. As noted above, all except the Philippines experienced growth rates above their long-term historical norms during the boom decade from the mid-1980s to the mid-1990s. Aggregate poverty incidences, both rural and urban, declined significantly. This was followed by recessions of varying depths from 1997 onwards, during which poverty incidence typically increased. However, aside from this similarity, their detailed experiences have been quite different. The rates at which agriculture has contracted as a share of GDP during the process of long-term economic growth have differed, along with degrees of industrialization. The above facts suggest that these counties provide different sets of empirical experience around a similar underlying structure, the circumstances in which pooling data is most likely to be appropriate. The diversity of their experience offers a natural experiment that may have useful lessons to offer.

Part 2 discusses some measurement issues affecting poverty measurement. Part 3 summarizes the available data on poverty incidence in eight Southeast Asian nations (all of ASEAN except Brunei and Singapore) and data on economic growth across all eight countries, except Myanmar. Part 4 sets out the analytical framework used to analyze the determinants of poverty reduction in the seven countries analyzed. Part 5 describes the statistical methods employed and the results. Part 6 concludes.

2. Measuring Poverty

Before we can analyze the determinants of poverty or the causes of changes in it, we must first quantify it. Seven kinds of measurement issues are crucial in assessing poverty incidence over time.

1. Are we discussing absolute or relative poverty? Measures of 'absolute poverty' relate to that part of the population whose incomes (or expenditures) fall below a given level (the poverty line) and whose value is held fixed in real purchasing power over time and across social groups. 'Relative poverty' means inequality, and to avoid confusion it is probably better to use that term. It compares the incomes (or expenditures) of the poor with those of the rich, or some other reference group. The two concepts are different because the overall size of the economic pie may change at the same time as its distribution is changing. Not surprisingly, when the overall size of the economic pie is changing significantly, measures of absolute poverty and inequality do not necessarily move in parallel, and may not even change in the same direction.

2. What variable is used for the calculations of poverty incidence? In Thailand, Malaysia and the Philippines the basis has been household income per household member, adjusted for the gender and age distribution of the household. Thailand has recently begun reporting separate poverty estimates based on household expenditures and incomes, respectively, but using the same numerical poverty lines for both. Indonesia and the newer ASEAN countries – Vietnam, Cambodia and Laos – use household expenditures. In Myanmar, household expenditures were used as the basis for the poverty estimates

reported by the UNDP in 2005 and 2010, but earlier government estimates based on household incomes were also published. The latter are not reported in this study because it is not clear how the poverty lines were adjusted over time in response to changing consumer prices.

The use of household expenditures for poverty measurement is more consistent with economic theory, in that expenditures are more directly related to household welfare than incomes. In addition, the measurement of income is problematic in rural areas, where much of the return to labor is in-kind and not easily converted to monetary values – a particular problem in subsistence agriculture. The distinction between income-based and expenditure-based measures of poverty is especially important when we are considering the impact on poverty of a short-term change in incomes. For example, poverty measures based on expenditure should not rise as much in response to a negative income shock as measures based on expenditures because households smooth essential expenditures over time by borrowing, selling assets and deferring non-essential expenditures.

3. What is the poverty measure? Most studies of poverty focus on the headcount measure of absolute poverty incidence, which means the proportion of the population whose incomes fall below a given threshold, held constant in real terms over time and across regions. At a conceptual level, this measure has the disadvantage that changes in it are due mainly to shifts in the living conditions of members of the population with incomes or expenditures close to the poverty line. Other measures of absolute poverty incidence lacking this disadvantage have been calculated from time to time, such as the poverty gap and poverty gap squared measures, but these calculations are normally highly correlated with the headcount measure.

4. What data source is used for the calculations? Virtually all countries use sample surveys to collect economic data at the household level and then use these sample-based data measurements to estimate indicators of poverty for the overall population. The exercise is a sample survey, not a census, and inevitably involves sample error. For example, in Thailand the periodic Socio-Economic Surveys (SES) conducted by the Thai government's National Statistical Office (NSO) provide virtually the sole source of reliable information at the household level that can be compared over time. (Krongkaew 1993 and Warr 2005) In the Philippines, a corresponding survey is the Family Income and Expenditure Survey, conducted every three years by the National Statistical Coordination Board. (Balisacan 2002) In Indonesia, the SUSENAS survey conducted by the Central Bureau of Statistics plays a similar role. It is conducted annually, but the specialized 'consumption module', which provides the most reliable basis for poverty estimation based on expenditures, is conducted only every three years. In Laos, the government's Lao Expenditure and Consumption Survey (LECS), conducted by the Bureau of Statistics, is the sole reliable basis for poverty estimates, but these surveys have been undertaken only every five years since 1992/93.

The statistical design and frequency of these surveys varies between countries. It is well-known that sample surveys may systematically under-represent poor people because

it is more difficult for enumerators to locate and obtain usable data from them. Statistical agencies differ in their methods for dealing with this problem. Within rural areas, production for own-consumption is important and allowances must be made for this, whether income or expenditure is used as the basis for poverty measurement. Again, the methods vary.

5. How is the base level of the poverty line determined? Some concept of the minimum level of income or expenditure per person must be established for a household to be classified as non-poor. Although studies of poverty measurement often give great attention to this matter, drawing upon studies of minimum nutritional requirements (Ravallion 1998), the level of this poverty line necessarily involves a large element of arbitrariness.

6. What is the poverty line deflator? This involves the way the poverty line is adjusted over time to keep its real purchasing power constant. Although this may seem a minor technical matter, it is a central issue for poverty measurement over time and across regions where consumer prices vary. Empirical studies of poverty incidence differ in their handling of this issue. The ideal deflator uses the actual expenditure pattern of the poor to weight price changes at the commodity level. This deflator may, at times, behave differently from the overall consumer price index (CPI), which reflects 'average' expenditure patterns. In particular, when the prices of food items move relative to other consumer goods prices the two series may diverge significantly because the share of food in the poverty line basket is higher than its share in the CPI basket.

7. Adjustment of the real poverty line over time? In rapidly growing economies, poverty incidence measured with a poverty line held constant in real purchasing power typically declines and may fall to very low levels. Statistical agencies frequently respond by adjusting the real value of the poverty line upwards. For example, in the cases of Thailand and Indonesia, this has happened several times. For users of the resulting data, the pressing issue concerns how to undo the effect of these upward revisions to obtain a time series based on constant real poverty lines. Sometimes statistical agencies publish overlapping series, based on the different poverty lines, thereby facilitating this process, sometimes not.

Regrettably, among the countries of Southeast Asia the detailed methods used to measure the headcount index differ widely between countries and this fact limits the degree to which the resulting measures can be compared meaningfully across countries.[2] Moreover, because the importance of omitted and included items may vary over time, as levels of income change, the differences may even affect comparisons across time for

[2] This problem is not confined to the countries of Southeast Asia. Elbers, et al. (2005), point out that the precise definition of what is included and excluded is almost never the same across any two countries. Because the importance of these omitted and included items may vary with the level of household expenditures, the differences can affect measured levels of inequality, making comparisons between countries tenuous and may even affect comparisons across time for individual countries.

individual countries. Table 1 documents this problem by comparing the data used in the estimation of poverty for the eight developing Southeast Asian countries under consideration, again excluding Brunei Darussalam and Singapore. They vary widely. As is well-known, for a poverty line of given monetary value, income-based measures (Malaysia, the Philippines, Thailand and Vietnam) typically reflect lower levels of poverty (and higher levels of inequality) than consumption-based measures (Cambodia, Indonesia, Laos, Thailand and Vietnam). Nevertheless, even within these broad measures, the included and excluded items vary.

As an example of this heterogeneity, consider the case of Laos. The Laotian government statistical agency measures consumption expenditure per capita at the household level. Expenditure items are divided into food and non-food categories. Food consumption is recorded using a 30-day diary, which records all food consumed, whether purchased or home-produced. The value of home-produced food is imputed at current market prices. Non-food expenditures are also recorded over a 30-day period, except for (i) twelve durable goods[3] and rents (cash or imputed) and (ii) a defined set of 'high-value' goods.[4] Category (i) items are excluded from measured consumption expenditure. However, consumption expenditures on category (ii) items are collected over a twelve-month period, divided by 12 and then added to other non-food monthly expenditures. The excluded items, such as imputed rent from owner-occupied housing (Laos is the only example among this group of countries where this applies), and at least some seemingly income-elastic durable goods, are likely to form a larger proportion of the true expenditures of richer than poorer households. Cambodia and Myanmar also exclude many durable goods from measured expenditures, though the particular details vary amongst these three countries.[5]

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[3] The 12 excluded durable items comprise beds, dining and lounge suites, stoves with ovens, refrigerators, axes, sewing machines, washing machines, cars and vans, motorcycles, TVs, VCRs and computers.

[4] These included high-value items are tables and chairs, cupboards, desks and sideboards, stools and benches, carpets, lamps, rugs, mats, pictures, stoves (non-electric), irons, electric fans, bicycles, watches, jewellery, airline tickets, expenses abroad, radio or cassettes players, cameras, other photographic and musical equipment, cellular phones and repairs of such items.

[5] In Myanmar, the 2009-2010 Integrated Household Living Conditions Assessment, conducted by the Myanmar government jointly with the United Nations Development Program (UNDP) and the Swedish International Development Cooperation Agency (SIDA), calculated durable goods user cost but ultimately excluded it from non-food consumption expenditures (IHLCA 2011). This produced estimates of the Gini coefficient of 0.19 and poverty incidence of 28 percent. Subsequent calculations reported by the World Bank (2014) used the same survey data but included expenditures on both health and durable goods, along with other statistical changes, leading to substantially higher estimates of both measures: Gini coefficient 0.28; poverty incidence 37.5 percent.

Table 1. Poverty measurement data sources: Southeast Asian developing countries

Countries[1]	**Data source**	**Income or consumption**	**Unit of observation**	**Imputed rent**[2]	**Durable goods**[3]	**Latest Gini**	**Latest year**
Cambodia	Cambodia Socio-Economic Survey	Consumption per month	Per capita	Included	Partially included[4]	0.29	2012
Indonesia	Survei Sosial Economi Nasional (Susenas)	Consumption per month	Per capita	Included as "self-assessed rent"	Included	0.41	2013
Lao PDR	Lao Expenditure and Consumption Survey (LECS)	Consumption per month	Per capita	Excluded	Partially included[5]	0.37	2012-13
Malaysia	Household Income and Basic Amenities Survey	Income per year	Per household	Included	n.a.	0.43	2012
Myanmar	Integrated Household Living Conditions Assessment (IHLCA)	Consumption per year	Per adult equivalent	Included	Excluded[6]	0.29	2009-10
Philippines	Family Income and Expenditure Survey (FIES)	Income per year	Per household	Included	n.a.	0.46	2012
Thailand	Socio-economic Survey (SES)	Income per month	Per capita	Included	n.a.	0.47	2013
	Socio-economic Survey (SES)	Consumption per month	Per capita	Included	Included	0.38	2013
Vietnam	Vietnam Household Living Standards Survey	Income per month	Per capita	Included	n.a.	0.40	2012
	Vietnam Household Living Standards Survey	Consumption per month	Per capita	Included	Included	0.36	2012

Notes for Table 1:

1. Two rows appear for Thailand and Vietnam because they produce estimates using both consumption and income data. Vietnam uses consumption for international reporting and income for domestic reporting.

Thailand reported only income-based estimates until 1986. Since then, both income and expenditure-based estimates have been produced.

2. 'Included' in this column means that imputed rent for owner-occupied housing is counted as an expenditure or income item. 'Excluded' means that actual payments of rent are included but not imputed rent for owner-occupied housing.
3. 'n.a.' in this column means 'not applicable' because the issue arises for expenditures, not incomes.
4. Included items for Cambodia are: home electronics (8 items); personal transport (4 items); household equipment (13 items); furniture (4 items); computers and printers (2 items); recreation (2 items); water sport (2 items); agriculture and other production (9 items).
5. Included items for Lao PDR are: tables and chairs, cupboards, desks and sideboards, stools and benches, carpets, lamps, rugs, mats, pictures, stoves (non-electric), irons, electric fans, bicycles, watches, jewelry, airline tickets, expenses abroad, radio or cassettes players, cameras, other photographic and musical equipment, cellular phones and repairs of such items. Excluded items include: beds, dining and lounge suites, stoves with ovens, refrigerators, axes, sewing machines, washing machines, cars and vans, motorcycles, TVs, VCRs, and computers.
6. Although the IHLCA 2009-2010 calculated durable goods user cost, this was ultimately excluded from non-food consumption expenditures.

Data sources:

CAMBODIA

Cambodia National Institute of Statistics. 2013. Cambodia - Cambodia Socio-Economic Survey 2012. http://nada.nis.gov.kh/index.php/catalog/25

Ministry of Planning, Cambodia. Poverty Estimate in 2012 in Cambodia. http://www.mop.gov.kh/LinkClick.aspx?fileticket=McAtA9QovCA percent3D&tabid=148&mid=696

LAO PDR

Soukhathammavong, N. et al. 2012. Policies and Practices on Poverty Eradication in Lao PDR. Presentation at the Workshop on Effective Policies and Experiences for Poverty Reduction in Asia, 23-25 October 2012. http://www.adbi.org/files/2013.05.08.cpp.sess3.1.poverty.eradication.lao.pdr.pdf

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Department of Statistics, Malaysia. 2012. Household Income and Basic Amenities Survey Report 2012. http://catalog.ihsn.org/index.php/catalog/5431

Malaysia Economic Planning Unit. 2013. Household Income and Poverty. http://www.epu.gov.my/en/household-income-poverty.

MYANMAR

Myanmar's Central Statistics Office conducted Household Income and Expenditure Surveys in 1989, 1997, 2001 and 2006 (see http://www.myanmar.cm/myanmardata2009/22.htm), but the data were published only in aggregate form and estimates of inequality measures were not reported. Two Integrated Household Living Conditions Assessment surveys (IHLCA) were conducted in 2004-05 and 2009-10, with assistance from the UNDP, UNICEF and SIDA. This has been the primary data source for poverty and inequality estimates subsequently published by UNDP and the World Bank.

Integrated Household Living Conditions Assessment in Myanmar (2009-2010) Technical Report. http://www.mm.undp.org/content/dam/myanmar/docs/Publications/PovRedu/MMR_FA1_IA2_Technical percent20Report-Eng.pdf

Integrated Household Living Conditions Assessment in Myanmar (2009-2010) - Poverty Profile. http://www.mm.undp.org/content/dam/myanmar/docs/FA1MMRPovertyProfile_Eng.pdf

World Bank. 2014. Myanmar: Ending poverty and boosting shared prosperity in a time of transition. A Systematic Country Diagnostic. http://www.worldbank.org/content/dam/Worldbank/document/EAP/Myanmar/WBG_SCD_Full_Report_English.pdf

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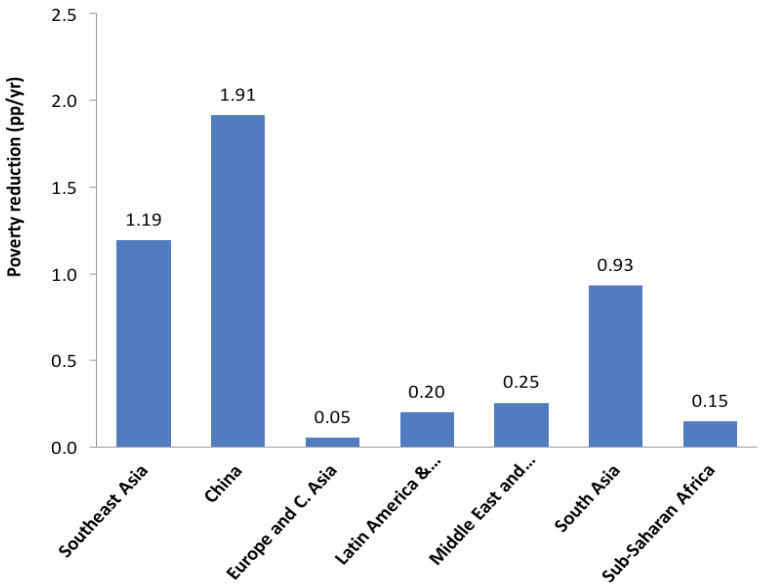
Philippine Statistical Agency (PSA). 2013. Filipino Families in the Poorest Decile Earn Six Thousand Pesos Monthly, on Average in 2012 (Results from the 2012 Family Income and Expenditure Survey). http://web0.psa.gov.ph/content/ilipino-families-poorest-decile-earn-six-thousand-pesos-monthly-average-2012-results-2012
PSA. 2003. Notes on the Official Poverty Statistics in the Philippines. http://www.nscb.gov.ph/technotes/poverty/concept.asp
THAILAND
National Statistical Office. http://web.nso.go.th/en/survey/house_seco/data/Whole percent20Kingdom_13_FullReport.pdf
Statistical Yearbook Thailand 2013. http://web.nso.go.th/en/pub/e_book/YEARBOOK_2013/
VIETNAM
Kozel, V. 2014. Updating Vietnam's Poverty Monitoring System. In Well begun but not yet done: progress and emerging challenges for poverty reduction in Vietnam. Washington, DC; World Bank Group. http://documents.worldbank.org/curated/en/2014/09/20204926/well-begun-not-yet-done-progress-emerging-challenges-poverty-reduction-vietnam-well-begun-not-yet-done-progress-emerging-challenges-poverty-reduction-vietnam
General Statistics Office (GSO), 2012. Poverty and Migration Profile 2012. http://www.gso.gov.vn/default_en.aspx?tabid=483&idmid=4&ItemID=13889
Phuong, N. et al. 2012. Vietnam: Poverty Data Governance. Presentation at the Workshop on Effective Policies and Experiences for Poverty Reduction in Asia, 23-25 October 2012. http://www.adbi.org/files/2012.10.25.cpp.sess5.11.viet.nam.poverty.data.gov.pdf

Finally, the World Bank also produces estimates of poverty incidence by taking data from national statistical agencies and amending it using its own statistical preferences. Unfortunately, these amendments are not fully transparent and the World Bank data contain many inexplicable errors, representing an even greater problem than that encountered with Asian Development Bank datasets. This paper focuses on the headcount measure of absolute poverty incidence – the proportion of the population whose expenditures or incomes (see below) fall below a fixed threshold, the poverty line, the monetary value of which is adjusted over time to maintain a constant real purchasing power. Wherever possible, the application of national data is preferred, followed by World Bank data, and finally Asian Development Bank data when national figures are unavailable.

3. Data on Poverty Incidence

Figure 1 and the upper half of Table 2 summarize the World Bank data on annual rates of poverty reduction in developing countries within six major regions of the world: Southeast Asia; China (listed here as a 'region' because of its size); Europe and Central Asia; Latin America and the Caribbean; the Middle East and North Africa; South Asia; and Sub-Saharan Africa. The periods covered are 1981 to 2008 for most regions. The extraordinary rate of poverty reduction in China dominates all other findings, with Southeast Asia second, followed by South Asia. In historical terms, the 1.2 per cent annual rate of poverty reduction achieved in Southeast Asia is truly remarkable, an achievement only overshadowed the even more rapid rate (2.8 per cent per annum) realized in China.

Figure 1. Annual Rates of Poverty Reduction
(percentage points per year)



Source: Author's calculations

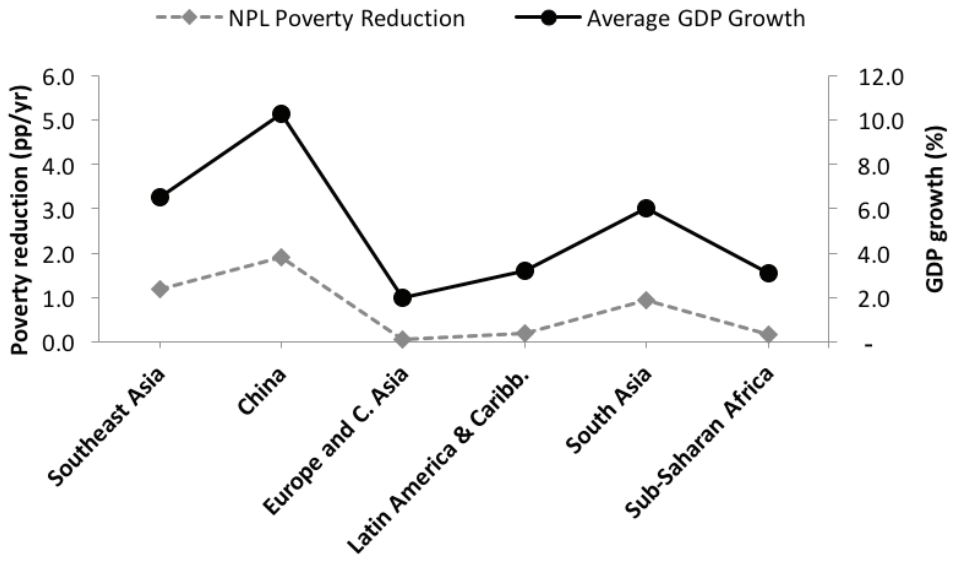
Table 2. Developing regions and countries: Annual rates of poverty reduction

Country/ region	Initial year	Final year	Initial value	Final value	Difference	Diff. per year
	(1)	(2)	(3)	(4)	[(3)-(4)]	[(3)-(4)]/ [(2)-(1)]
China [a]	1981	2008	88.32	14.65	73.67	2.73
Europe and Central Asia [a]	1981	2008	1.91	0.47	1.44	0.05
Latin America/Caribbean [a]	1981	2008	11.89	6.47	5.42	0.20
Middle East/ Nth. Africa [a]	1981	2008	9.56	2.7	6.86	0.25
South Asia [a]	1981	2008	61.14	35.97	25.17	0.93
Sub-Saharan Africa [a]	1981	2008	51.45	47.51	3.94	0.15
South East Asia [a]	1981	2008	45.04	12.81	32.23	1.19
Cambodia [b]	2003	2012	50.2	17.7	32.5	3.61
Indonesia [b]	1976	2016	62.6	10.9	51.7	1.29
Laos [b]	1992	2012	46.0	23.2	22.8	1.14
Malaysia [b]	1970	2014	52.4	0.6	51.8	1.18
Myanmar [b]	2005	2010	32.1	25.6	6.5	1.30
Philippines [b]	1961	2015	50.8	21.3	29.5	0.55
Thailand [b]	1969	2016	63.1	3.5	59.6	1.27
Vietnam [b]	1998	2014	54.5	13.5	41.0	2.56

Note: Initial values and final values of poverty incidence are expressed in percent of population.
Sources: a. World Bank, Povcal database. Poverty line: US$ 1.25 at 2005 PPP, except for China, where it is US$1.90 at 2011 PPP.
b. Individual country national data sources using national poverty lines.

What could explain the huge variation among regions in the rate of poverty reduction? Figure 2 compares the data in Figure 1 with data on real GDP growth per person over the same periods. The correlation is unmistakable. Such a correlation doesnot necessarily mean causation, and it would be absurd to suggest that economic growth was the sole determinant of poverty reduction, but this data suggests that it is at least an important one.

Figure 2. Annual Rate of Poverty Reduction and Economic Growth
(percentage points per year)

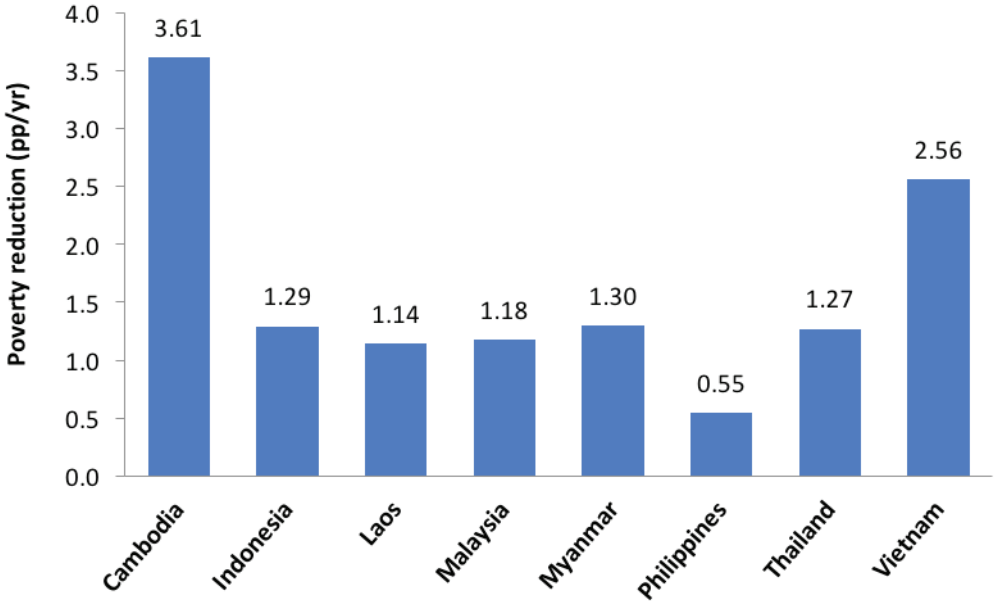


Note: See Table 2. 'Poverty Reduction' means the annual rate of poverty reduction based on the World Bank poverty line of US$ 1.25 per day at 2005 purchasing power parity from 1981 to 2008 (US$1.90 at 2011 PPP in the case of China). 'GDP growth' means the average annual rate of growth of real GDP per capita over the same period as above.
Source: Author's calculations

The available data on the headcount measure of poverty incidence in the eight Southeast Asian countries listed above is summarized in the lower half of Table 1 and in Figure 3. Poverty reduction was most rapid in Cambodia, followed by Vietnam, Myanmar, Indonesia, Thailand, Malaysia[6], Laos and the Philippines, respectively. There is again considerable variation. Cambodia's annual rate of poverty reduction was 6.6 times that of the Philippines and Vietnam's annual rate was 4.7 times the Philippines'. Why? One reason is presumably that in these two countries national income per person grew more rapidly than in the Philippines (3.7 and 2.9 times, respectively). The correlation between annual rates of poverty reduction and GDP growth per person is shown in Figure 4. Again, correlation does not necessarily mean causation, though it could mean that, even though other factors must surely have been important as well.

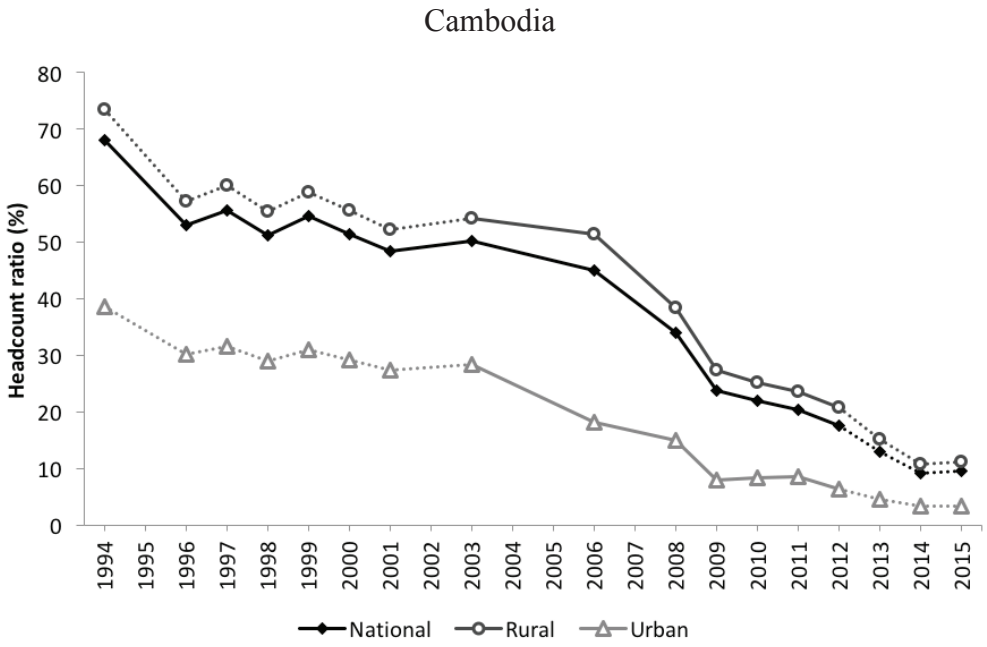
[6] It should be noted that for Myanmar only two data points (2005 and 2010) are available.

Figure 3. Southeast Asia: Annual Rates of Poverty Reduction
(percentage points per year)



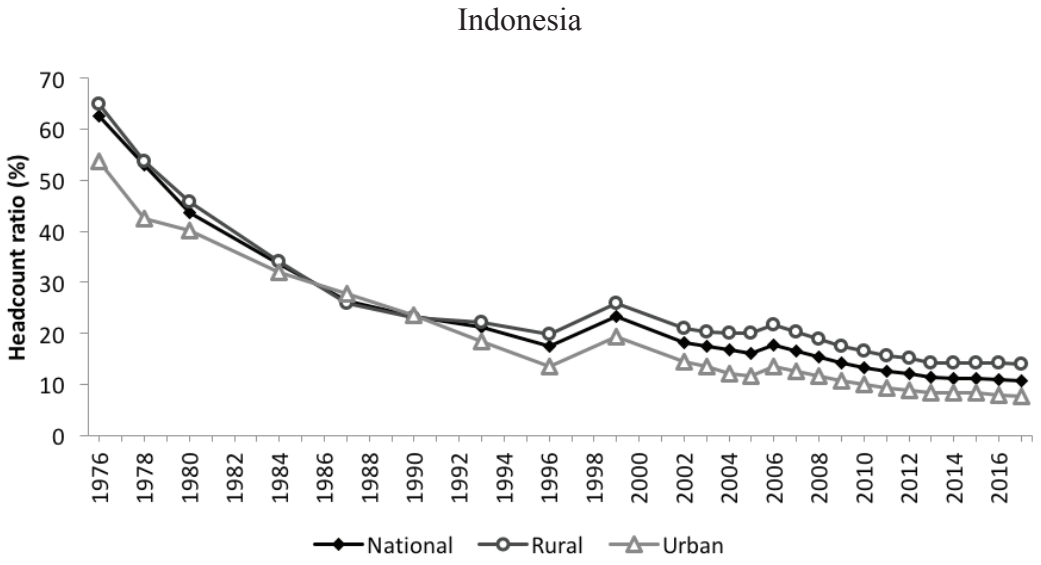
Source: Author's calculations

Figure 5. Cambodia: Poverty incidence, 1994 to 2015



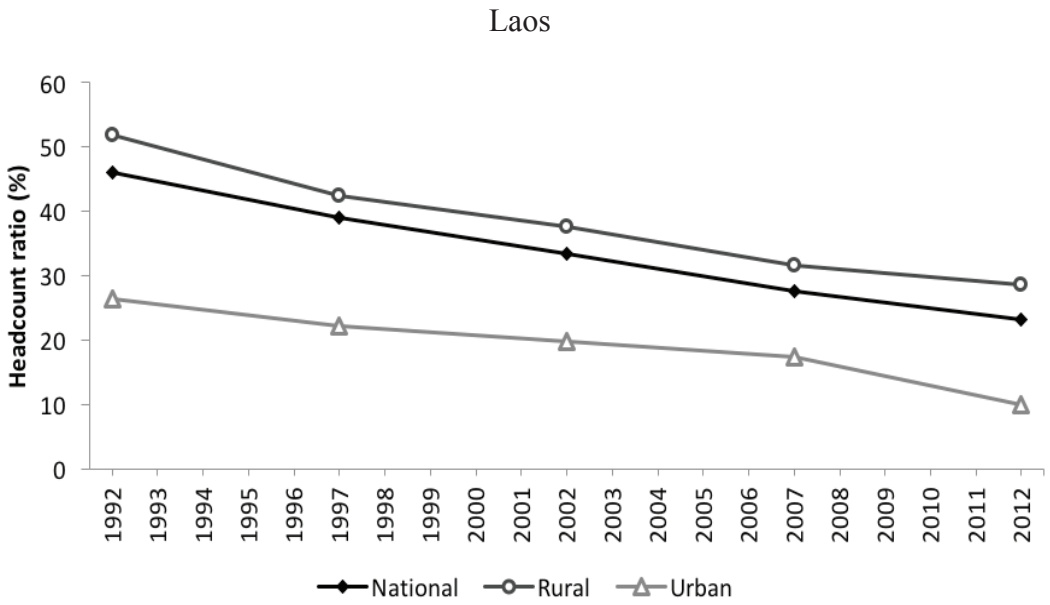
Source: Author's calculations

Figure 6. Indonesia: Poverty incidence, 1976 to 2017



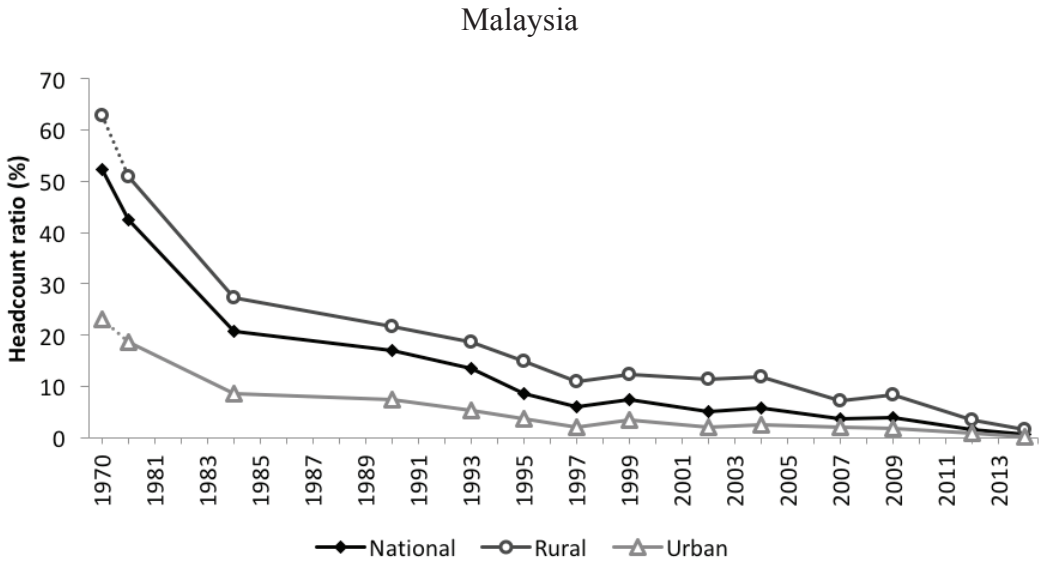
Source: Author's calculations

Figure 7. Laos: Poverty incidence, 1992 to 2012



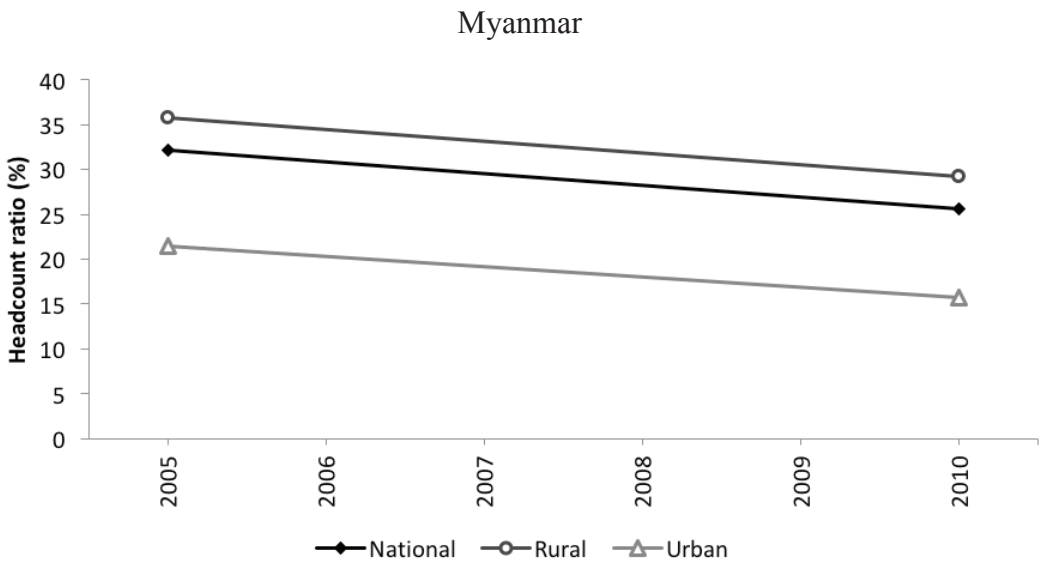
Source: Author's calculations

Figure 8. Malaysia: Poverty incidence, 1970 to 2014



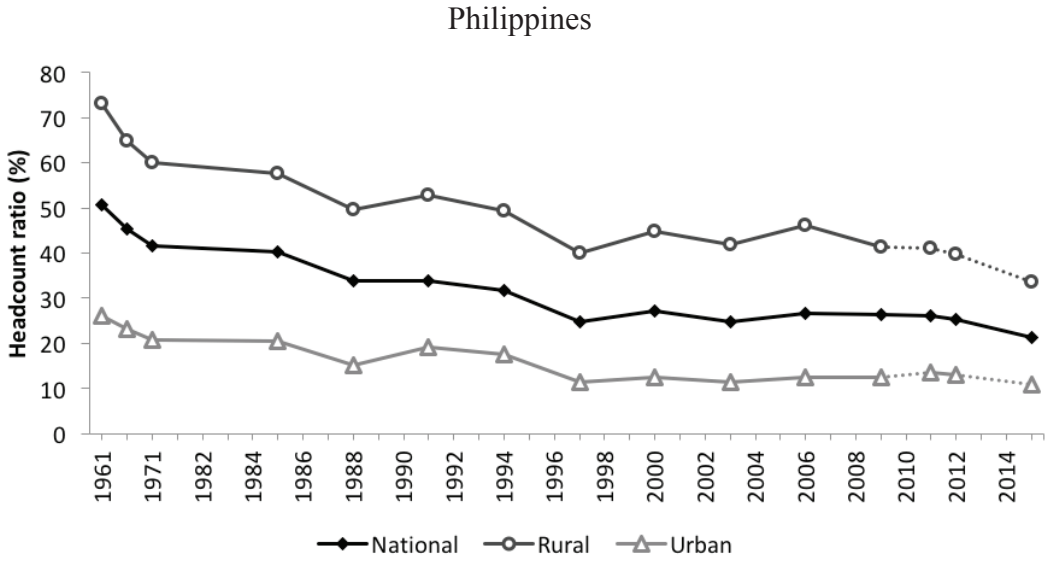
Source: Author's calculations

Figure 9. Myanmar: Poverty incidence, 2005 to 2010



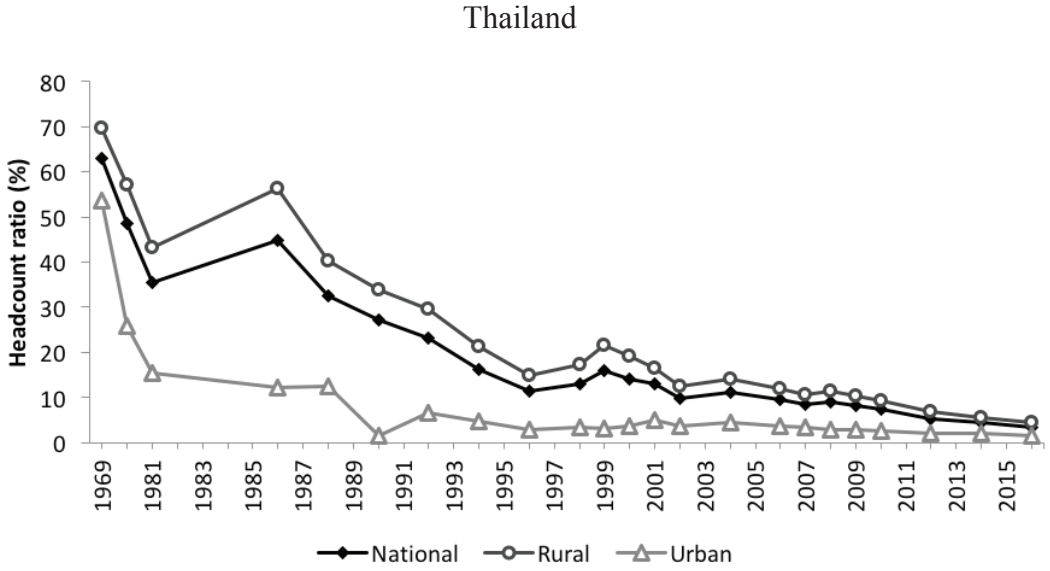
Source: Author's calculations

Figure 10. The Philippines: Poverty incidence, 1961 to 2015



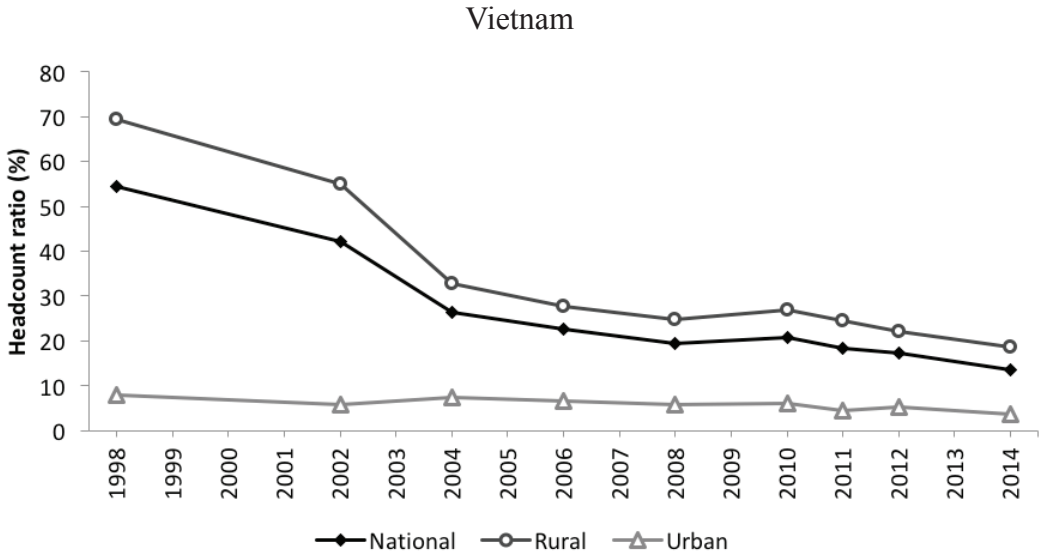
Note: Dashed lines indicate interpolated data or data from sources other than national statistical agency.
Source: Author's calculations

Figure 11. Thailand: Poverty incidence, 1969 to 2014



Source: Author's calculations

Figure 12. Vietnam: Poverty incidence, 1998 to 2014



Source: Author's calculations

Figures 5 to 12 summarize the available data on national, rural and urban poverty. For most Southeast Asian countries, the absolute magnitudes of the reductions in poverty incidence, at all three levels, are stunning. The relationship between these three measures is as follows. We shall write N, N^R and N^U for the total, rural and urban populations, respectively, where $N = N^R + N^U$. Let $\alpha^R = N^R / N$ and $\alpha^U = N^U / N$ for the rural and urban shares of the total population, respectively, where $\alpha^R + \alpha^U = 1$. The total amount of poor people is represented by $N_P = N_P^R + N_P^U$, where $N_P^R + N_P^U$ denotes the number of people classified as living in poverty in rural and urban areas, respectively. The aggregate poverty incidence is given by:

$$P = N_P / N = (N_P^R + N_P^U) / N = \alpha^R P^R + \alpha^U P^U \quad (1)$$

where $P^R = N_P^R / N^R$ denotes the proportion of the rural population that is in poverty and $P^U = N_P^U / N^U$ the corresponding incidence of poverty in urban areas.

Now, differentiating (1) totally, we obtain a key relationship,

$$dP = \alpha^R dP^R + \alpha^U dP^U + (P^R - P^U) d\alpha^R \quad (2)$$

From (2), the change in poverty incidence may be decomposed into three parts: (i) the change in rural poverty incidence, weighted by the rural population share, (ii) the change in urban poverty incidence, weighted by the urban population share, and (iii) the movement of populations from rural to urban areas, weighted by the difference in poverty incidence between the two areas concerned.

The last of these terms is described by Anand and Kanbur (1985) and by Ravallion and Datt (1996) as representing the 'Kuznets effect'. As the population moves from rural

to urban areas, a change in the aggregate poverty incidence will occur even at constant levels of rural and urban poverty incidences, provided that the levels of poverty incidence in these two sectors are different. In growing economies, we expect to find that the rural population share is falling ($d\alpha^R < 0$). Furthermore, the incidence of poverty in rural areas typically exceeds that in urban areas (($P^R - P^U$) > 0). Thus, the expected sign of $(P^R - P^U)d\alpha^R$ is negative. How important the Kuznets effect is as a determinant of overall poverty reduction is, of course, an empirical matter.

Table 3(a,b) summarizes these data by taking the mean rate of change of total poverty incidence and decomposing it, as in equation (2). For example, the mean annual change in the aggregate level of poverty incidence for Indonesia was -1.28 percentage points per year (i.e. an annual reduction, on average, in the nationwide headcount incidence of poverty from 20 per cent to 18.72 per cent of the total population). Equation (2) is an identity and must apply at all points in the data set. It must, therefore, apply at the means of the data. The equation shows that this mean aggregate change in poverty incidence can be decomposed into three components: average poverty reduction in urban areas, average poverty reduction in rural areas, and the average movement of population between these two areas. In understanding the table it is important that the rows 'Urban' and 'Rural' do not mean the average rate of poverty reduction in urban and rural areas, but these rates multiplied by their population shares, as indicated on the right hand side of Equation 2.

Table 3a. Data decomposition: Mean annual changes in poverty incidence

	Actual							
	Indonesia	**Laos**	**Malaysia**	**Myanmar**	**Philippines**	**Cambodia**	**Thailand**	**Vietnam**
National [a]	-1.281	-1.227	-0.932	-1.300	-0.695	-1.760	-1.301	-2.174
Urban [b]	-0.313	-0.129	-0.150	-0.305	-0.177	0.131	-0.191	-0.188
Rural [c]	-0.911	-1.051	-0.524	-0.973	-0.401	-1.357	-1.107	-1.887
Migration [d]	-0.057	-0.046	-0.259	-0.022	-0.117	-0.534	-0.003	-0.099
	Normalized (National = 100)							
National [a]	100	100	100	100	100	100	100	100
Urban [b]	24.43	10.54	16.05	23.44	25.41	-7.47	14.67	8.65
Rural [c]	71.10	85.70	56.22	74.86	57.72	77.11	85.11	86.80
Migration [d]	4.46	3.77	27.73	1.69	16.87	30.36	0.22	4.55

Notes: National = Urban + Rural + Migration

a : Mean annual value of dP, the y-o-y change in national poverty incidence.

b : Mean annual value of αU dPU, the y-o-y population share-weighted change in urban poverty.

c : Mean annual value of αR dPR, the y-o-y population share-weighted change in rural poverty.

d : Mean annual value of (PR – PU) dαR, the y-o-y migration-induced change in national poverty.

Sources: Author's calculations, using data sources as in Table 1. The decomposition of the change in aggregate poverty incidence follows equation (2).

Table 3b. Average rates of poverty reduction, economic growth and variable correlations

	Indonesia	**Laos**	**Malaysia**	**Philippines**	**Thailand**	**Vietnam**
Poverty reduction per year						
Total	-1.28	-1.23	-0.93	-0.76	-1.30	-2.17
Urban	-1.12	-0.61	-0.37	-0.45	-0.65	-0.78
Rural	-1.25	-1.34	-0.91	-0.76	-1.55	-2.46
Growth rate per capita per year						
GDP	4.53	4.35	4.57	0.74	3.51	5.68
Agriculture	0.38	2.27	0.04	0.13	0.29	0.59
Industry	1.79	1.36	2.41	-0.03	1.81	2.88
Services	2.49	1.23	2.46	0.72	1.54	2.26
Annual food CPI/ general CPI ratio	0.92	1.03	0.96	1.04	1.00	1.09
Correlation between total poverty reduction per year and independent variables						
GDP	-0.56	0.12	-0.53	-0.26	-0.52	0.04
Agriculture	-0.71	-0.86	-0.12	-0.18	-0.51	-0.34
Industry	-0.34	0.96	-0.51	-0.24	-0.37	-0.23
Services	-0.25	0.54	-0.23	-0.17	-0.58	0.44
Food CPI/ general CPI ratio	0.45	-0.87	0.67	-0.52	0.37	0.63
Correlation between rural poverty reduction per year and independent variables						
GDP	-0.52	0.12	-0.56	-0.32	-0.51	-0.10
Agriculture	-0.69	-0.86	0.20	-0.23	-0.49	-0.33
Industry	-0.29	0.96	-0.47	-0.27	-0.36	-0.34
Services	-0.24	0.54	-0.43	-0.25	-0.57	0.30
Food CPI/ general CPI ratio	0.39	-0.87	0.66	-0.42	0.35	0.60
Correlation between urban poverty reduction per year and independent variables						
GDP	-0.60	0.38	-0.32	-0.61	-0.19	0.80
Agriculture	-0.41	-0.70	0.23	-0.25	0.25	0.10
Industry	-0.13	1.00	-0.26	-0.58	-0.21	0.59
Services	-0.50	0.74	-0.28	-0.49	-0.25	0.80
Food CPI/ general CPI ratio	0.51	-0.71	0.58	-0.31	0.16	0.19
Years covered	1976-2011	1992-2007	1970-2009	1961-2009	1969-2009	1998-2011
Observations	18	3	11	10	18	7

Notes: All growth rates are in real, per capita terms. 'Agriculture' means the per capita growth rate of real value-added in agriculture, and similarly for 'Industry' and 'Services'. Consequently, the sectoral GDP share-weighted sum of the per capita growth rates of the three sectors is equal to the per capita growth rate of GDP.

For each country, the number of observations appearing in the final row of the table is the number of observations of poverty reduction, equal to the number of observations of poverty incidence minus one.

Source: Author's calculations

The second half of the table normalizes the decomposition by dividing all values by the mean change in aggregate poverty (-1.28 for Indonesia, for example) and multiplying this by 100. In Indonesia, for example, reductions in rural poverty accounted for 71 per cent of the overall reduction in poverty, reduced urban poverty amounted to 24 per cent and rural to urban migration to about five per cent of the overall reduction in poverty at the national level. In all eight countries, reductions in rural poverty account for more than half of the total reduction in poverty and, in all except Malaysia and Cambodia, reductions in urban poverty were more important than migration effects.

The above calculations are, of course, merely descriptions of the data. We now turn to the question of what caused these observed changes in poverty incidence. It is hypothesized in this paper that poverty reduction is driven by economic growth, possibly influenced by its sectoral composition, and further by the relative price of food, meaning the price of food as a component of the consumer price index relative to the overall consumer price index. The average data on these variables and the correlations between them at an individual country level are summarized in Table 3. We now turn to a regression model intended to sort out the causal relationships among these variables.

4. The Growth-Poverty Nexus

4.1 Conceptual Background

Poverty incidence and its change over time depend on many factors, of which economic variables are at most only part of the story. Among the economic variables, many issues are relevant aside from simply the overall growth rate of output. Changes in commodity prices play a role, along with tax and public expenditure policies. But policy discussion in almost all countries is heavily concerned with economic growth and its sectoral composition. Policy makers, rightly, wish to know the extent to which this growth is inclusive. In particular, they wish to now whether concern with growth is consistent with the goal of reducing poverty. Does economic growth cause poverty reduction, and if so, to what extent? Does the sectoral composition of that growth matter in terms of its poverty-reducing effects? Do relative prices, especially the relative price of food, matter for poverty reduction?

Three methodological approaches can be found in the literature with respect to addressing these questions empirically. Each is problematic, but in different ways. General equilibrium modeling (GEM) has the advantage of permitting controlled experiments with the models, changing only one exogenous variable at a time and finding the effects on all the endogenous variables of interest. This approach permits detailed analysis of the economic mechanisms through which output growth operates on poverty incidence (Fane and Warr 2004). Since the distinction between the exogenous and endogenous variables within the models is unambiguous, by construction, there are clear causal relationships between changes in the exogenous variables and their effects on the endogenous variables. These models are nevertheless subject to the objection that the

inherent causal relationships are predetermined in that they are built into the structure of the models themselves. For example, the qualitative result that economic growth reduces poverty is a direct consequence of the structural assumptions of the models. Moreover, the quantitative results are a function of the chosen values of the large numbers of behavioral parameters necessarily used within the models. Although the key parameters can be varied to show their implications for the relationships of interest, the fact remains that the true values of these parameters are largely unknown.

A second approach relies solely on household survey data to construct the distribution of real expenditures across households and to analyze the relationships among variables calculated from this distribution. For example, this approach computes the relationship between changes in the mean of the expenditure data and changes in the level of poverty incidence, calculated from the same distribution. Changes in the mean of real household expenditures is taken to be a measure of (or proxy for) economic growth. These analyses have the advantage of working with internally consistent data and can provide a description of relationships among various features of the expenditure distribution. The problem is that these relationships lack a causal basis. It is no more true to say that changes in the mean of the distribution of household expenditures causes changes in poverty incidence than to say the reverse. But policy application requires knowledge of causal relationships. Statistical descriptions of relationships among variables constructed from the distribution of household expenditures do not provide that. In any case, the rate of change of mean household expenditures is not the same thing as economic growth, meaning the expansion of economic output. The link between output growth and poverty incidence is the causal relationship we wish to study. Beyond this, we wish to ask how the sectoral composition of economic growth might influence the rate at which poverty incidence declines and this is clearly impossible with this second approach.

A third approach involves assembling statistical data on changes in poverty incidence and data on output growth and its composition. It then regresses the former on the latter. The fact that separate data sets are involved – the national accounts for economic growth and household survey data for poverty incidence – has both advantages and disadvantages. Suppose it is found that economic growth leads to reductions in poverty incidence. It could not be said that this finding was a mere statistical artifact arising from the use of the same flawed data set to measure both variables, because quite different data sets are used to measure the two sets of variables. However, this also creates problems. The frequency of the data may not be the same. National accounts data is available at least annually, but this is seldom true of poverty incidence data, which is usually available only at intervals of two to three years at least. The advantage of this approach is that it focuses directly on a causal relationship of strong policy interest (Ravallion and Datt 1996). Despite its limitations, this is the approach used in the present study.

The economic development literature has emphasized the sectoral composition of growth in relation to its implications for poverty reduction, but this emphasis has been based primarily on a priori theorizing, rather than evidence. The obvious argument is that in most poor countries the majority of the poor lives in rural areas and is employed in agriculture. From this it has seemed probable that the growth of agriculture is more important in terms of achieving poverty reduction than the expansion of industry or services. However, this conclusion does not necessarily follow. Sectoral growth rates may not be independent. Expansion of capacity in one sector—say, food processing—may stimulate output growth elsewhere—say, fruit production. More importantly, people are potentially mobile; given sufficient time, even poor people can presumably move to whichever sector is generating the growth. Rural poverty may, therefore, be reduced by urban-based growth, drawing the poor away from rural areas (Fields, 1980; Chenery and Syrquin, 1986). When sectoral interdependence and intersectoral factor mobility are taken into account, it is not obvious whether the sectoral composition of growth is important for poverty reduction or not.

Even if labor were fully and instantaneously mobile, poverty incidence could still be affected by the sectoral composition of growth. To a first order of approximation, the level of absolute poverty presumably depends on the demand for the factors of production owned by the poor, especially unskilled labor and, to a lesser extent, agricultural land. Growth in different sectors has differential effects on the demand for these factors, depending on these sectors' factor intensities, and may have different effects on poverty, inequality, or both. Finally, the rural/urban distinction is not synonymous with the distinction of agriculture/non-agriculture. Much agricultural production may occur in full or part-time farming on the fringes of urban areas and much industrial and services activity may occur in rural areas.

Only careful quantitative analysis can resolve questions of this kind, but the limited availability of data that can potentially support such statistical analysis has been an impediment to the systematic study of poverty incidence and its determinants. Some recent studies have attempted to explore the relationships involved by analyzing cross-sectional data sets across countries, or across regions, or households for individual countries, while others have attempted to assemble long-term time-series data sets on poverty incidence for individual countries. The time-series approach is generally preferable, in that it makes possible a direct study of the determinants of changes in poverty at an aggregate level.

Unfortunately, in most developing countries, the consumer expenditure surveys on which studies of poverty incidence must be based are conducted only intermittently. Data is thus available at most only with intervals of several years between observations. This is true of all the Southeast Asian countries surveyed. The data is most extensive with Indonesia and Thailand, but even when all national time-series observations on poverty incidence are assembled in their case, the number of observations of poverty incidence concerning each country is only 19, giving 18 observations of changes in poverty incidence.

For Malaysia the corresponding numbers are only 12 and 11, for the Philippines 11 and 10 and fewer for the others These numbers are insufficient to sustain formal statistical analysis for any one of these countries, but when all Southeast Asian countries are pooled, the total number of observations of changes in poverty incidence is 67, adequate for the purposes of the present study.

In each country the value of the national poverty line is held constant over time, but since the meaning of poverty lines is different in each of the countries, we should not assume that the same quantitative relationship between poverty incidence and aggregate growth will necessarily exist in all the nations under consideration. In the present study, intercept dummy variables were used for five of the remaining six countries. It must be recognized that the use of dummy variables is an imperfect way of capturing the possible effects of different national poverty lines. The strong assumption being made is that the underlying relationship between changes in poverty incidence (the dependent variable) and the rate of growth (the dependent variable) is linear and follows the same slope in all countries, differing only in the intercept terms.

Each interval between the data points for poverty incidence is used to construct the values of the dependent variables described below, with the calculated value divided by the number of years corresponding to that time interval. This gives an annual rate of change for the variable concerned. These annualized rates of change then become the variables used in the regression analysis described below.

4.2 Poverty and Aggregate Growth

We now turn to the manner in which poverty incidence is affected by economic growth. For simplicity, we hypothesize initially the simplest possible relationship between these variables, where the total number of households in poverty, N_P , depends on the aggregate level of real income per unit of population, Y , and the relative price of food, R^F. Thus, poverty incidence is given by:

$$P = N_P / N = \varphi(Y, R^F) \tag{3}$$

Totally differentiating this equation,

$$dP = \varphi_Y Yy + \varphi_R dR^F \tag{4}$$

where dP represents the change in poverty incidence, dR^F represents the change in the real price of food and lower case Roman letters represent the proportional changes of variables represented in levels by upper case Roman letters. Thus $y = dY / Y$ is the growth rate of aggregate real income per person. In this case, we estimate relationships of the kind:

$$dP = a + by + cdR^F \tag{5}$$

and test whether the coefficients b and c are significantly different from zero.

4.3 Poverty and Sectoral Growth

Whether the sectoral composition of economic growth is significant for poverty reduction can be investigated as follows. The level of real GDP per person is given by:

$$Y = Y_a + Y_i + Y_s \tag{6}$$

where Y_a, Y_i, Y_s and denote value-added (contribution to GDP) per person in the total population, measured at constant prices, in agriculture, industry, and services, respectively. The overall real rate of growth per person can be decomposed into its sectoral components from:

$$y = H_a y_a + H_i y_i + H_s y_s \tag{7}$$

where $H_k = Y_k / Y$, $k = (a, i, s)$, denotes the share of sector k in GDP. By estimating

$$dP = a + b_a H_a y_a + b_i H_i y_i + b_s H_s y_s + cdR^F \tag{8}$$

and testing whether $b_a = b_i = b_s$, we may test directly whether the sectoral composition of growth affects the rate of poverty reduction. By testing whether $c = 0$, we can test whether the price of food plays a significant role in determining changes in poverty incidence and, if so, in what direction.

5. Estimation Results

5.1 Poverty and Aggregate Growth

Equation (5) was estimated as described above and the results summarized in Table 4. In view of the fact that the dependent variable is the change in poverty incidence (a negative value indicating a reduction in poverty) a negative estimated coefficient means that an increase in the variable is associated with a reduction in poverty. A positive sign indicates the opposite. In Regression (1) dummy variables were estimated for all countries except Indonesia (the base country). All country dummy variables were insignificant, except Vietnam. The coefficient on aggregate GDP growth was negative as expected and highly significant (99% confidence level). Higher rates of GDP growth per capita induce larger reductions in poverty. The coefficient on food price was positive and significant at the 90% level, indicating that a higher relative price of food reduces the rate at which poverty declines. To test whether any endogeneity of the food price variable is important, the equation was re-estimated in Regression (2) without this variable. If GDP growth was affecting poverty via the price of food dropping, this variable (not controlling for the price of food) should increase the estimated coefficient on GDP growth. The coefficient does increase, but not greatly.

Table 4. National poverty and aggregate growth

	(1)	(2)	(3)
	Dependent variable: Change in national poverty		
Independent variables:			
GDP growth p.c.	-0.182***	-0.219***	-0.229***
	(0.066)	(0.060)	(0.057)
Real price of food	4.541*		
	(2.694)		
Laos	-0.666	-0.243	
	(0.962)	(0.911)	
Malaysia	-0.155	-0.024	
	(0.592)	(0.588)	
Philippines	-0.702	-0.413	
	(0.681)	(0.649)	
Thailand	-0.814	-0.543	
	(0.549)	(0.512)	
Vietnam	-2.284**	-1.638**	-1.673**
	(0.893)	(0.749)	(0.721)
Constant	-3.291	0.094	-0.242
	(2.634)	(0.452)	(0.292)
N	58	58	58
R^2	0.324	0.301	0.223
$adj.R^2$	0.229	0.219	0.209
F-statistic	3.42	3.66	16.05
p-value	0.0046	0.0043	0.0002

Note: "p.c." means per capita. Standard errors in parentheses.
* denotes significantly different from zero at 90 per cent confidence level
** denotes significantly different from zero at 95 per cent confidence level
*** denotes significantly different from zero at 99 per cent confidence level
Source: Author's calculations

In Regression (3) the insignificant variables (except the constant term) were all dropped, in line with the general-to-specific approach of Hendry (1995), and the equation was re-estimated. The estimated coefficient on aggregate growth remains significant. The estimated relationship is highly significant and the Ramsey RESET test suggests that it has no omitted variables, although with low degrees of freedom, this test is relatively weak. The Breusch-Pagan/Cook Weisberg test for heteroskedasticity indicates the absence of heteroskedasticity. The results indicate that more rapid growth of real GDP per capita and reductions in the real price of food are both significant sources of poverty reduction.

5.2 Poverty and Sectoral Growth

Is the sectoral composition of the growth important? Equation (8) was now estimated to capture the behavior of the dependent variable when the sectoral composition of growth appears on the right hand side of the equation. The results are shown in Table

5 and the follow the pattern of presentation used in Table 4. The findings support the notion that the growth of agriculture and the real price of food are significant determinants of the rate of poverty reduction. Other components of GDP had the expected signs, but were statistically insignificant. All country intercept dummy variables, except Vietnam, were highly insignificant and were dropped.

Table 5. National poverty and sectoral growth

	(4)	(5)	(6)
	Dependent variable: Change in national poverty		
Independent variables:			
Agricultural growth p.c.	-1.232**	-1.107**	-0.739**
	(0.523)	(0.526)	(0.344)
Industrial growth p.c.	-0.096	-0.147	
	(0.124)	(0.122)	
Services growth p.c.	-0.206	-0.258*	
	(0.135)	(0.133)	
Real price of food	4.436		6.211***
	(2.735)		(2.256)
Laos	0.939	1.200	
	(1.230)	(1.240)	
Malaysia	-0.776	-0.515	
	(0.659)	(0.649)	
Philippines	-1.002	-0.617	
	(0.685)	(0.653)	
Thailand	-1.019*	-0.668	
	(0.560)	(0.525)	
Vietnam	-2.205**	-1.447*	-2.420***
	(0.898)	(0.780)	(0.753)
Constant	-3.889	0.364	-6.656***
	(2.664)	(0.481)	(2.175)
N	58	58	58
R^2	0.377	0.343	0.261
adj.R^2	0.260	0.235	0.206
F-statistic	3.22	3.19	4.69
p-value	0.0049	0.0054	0.0026

Note: "p.c." means per capita. Standard errors in parentheses.
* denotes significantly different from zero at 90 per cent confidence level
** denotes significantly different from zero at 95 per cent confidence level
*** denotes significantly different from zero at 99 per cent confidence level

Source: Author's calculations

An F-test of the hypothesis that the coefficients on share-weighted sectoral growth rates per capita were all equal ($b_a = b_i = b_s$) was rejected at the 5 per cent level of significance. In short, the data indicate that the growth of agriculture is more important for poverty reduction than the growth of either industry or services. The data also confirms that the real price of food is an important determinant of poverty reduction – lower real food prices are associated with higher rates of poverty reduction.

A similar exercise was now conducted with changes in rural poverty as the dependent variable (Table 6) and changes in urban poverty (Table 7). In the case of rural poverty, the results are qualitatively similar to those obtained for national poverty in Table 5, but stronger. Growth in agriculture and services contributes to poverty reduction, but the effect of industrial growth is statistically insignificant. Higher real prices of food are strongly associated with increases in poverty incidence. In the case of urban poverty (Table 7), the attempted explanation was unsuccessful. Only the real price of food was significant, in the same direction as above.

Table 6. Rural poverty and sectoral growth

	(7)	**(8)**	**(9)**
	Dependent variable: Change in national poverty		
Independent variables:			
Agricultural growth p.c.	-1.716**	-1.585**	-0.982**
	(0.672)	(0.670)	(0.446)
Industrial growth p.c.	-0.105	-0.159	
	(0.160)	(0.156)	
Services growth p.c.	-0.291*	-0.346**	-0.362**
	(0.173)	(0.169)	(0.158)
Real price of food	4.646		7.105**
	(3.513)		(2.922)
Laos	1.458	1.732	
	(1.581)	(1.579)	
Malaysia	-1.139	-0.865	
	(0.846)	(0.826)	
Philippines	-1.255	-0.852	
	(0.880)	(0.831)	
Thailand	-1.489**	-1.121	-0.987*
	(0.720)	(0.669)	(0.566)
Vietnam	-2.614**	-1.821*	-2.920***
	(1.154)	(0.993)	(0.975)
Constant	-3.649	0.805	-7.443**
	(3.422)	(0.612)	(2.817)

	(7)	(8)	(9)
	Dependent variable: Change in national poverty		
N	58	58	58
R^2	0.374	0.351	0.246
adj.R^2	0.257	0.246	0.189
F-statistic	3.19	3.32	4.32
p-value	0.0042	0.0041	0.0042

Note: "p.c." means per capita. Standard errors in parentheses.
* denotes significantly different from zero at 90 per cent confidence level
** denotes significantly different from zero at 95 per cent confidence level
*** denotes significantly different from zero at 99 per cent confidence level
Source: Author's calculations

Table 7. Urban poverty and sectoral growth

	(10)	(11)	(12)
	Dependent variable: Change in national poverty		
Independent variables:			
Agricultural growth p.c.	0.642	0.683	
	(0.461)	(0.453)	
Industrial growth p.c.	-0.082	-0.099	
	(0.110)	(0.105)	
Services growth p.c.	-0.143	-0.160	
	(0.118)	(0.114)	
Real price of food	1.460		3.691*
	(2.407)		(1.928)
Laos	-1.078	-0.991	
	(1.083)	(1.067)	
Malaysia	0.807	0.894	
	(0.580)	(0.558)	
Philippines	0.133	0.260	
	(0.603)	(0.562)	
Thailand	0.246	0.361	
	(0.493)	(0.452)	
Vietnam	-0.321	-0.071	
	(0.791)	(0.671)	
Constant	-1.881	-0.482	-4.164**
	(2.344)	(0.414)	(1.859)
N	58	58	58
R^2	0.173	0.167	0.076

	(10)	(11)	(12)
	Dependent variable: Change in national poverty		
adj.R^2	0.018	0.031	0.006
F-statistic	1.12	1.23	1.09
p-value	0.368	0.303	0.372

Note: "p.c." means per capita. Standard errors in parentheses.
* denotes significantly different from zero at 90 per cent confidence level
** denotes significantly different from zero at 95 per cent confidence level
*** denotes significantly different from zero at 99 per cent confidence level
Source: Author's calculations

As rural poverty dominates total poverty, the findings on rural poverty largely explain the total poverty results. The growth of agriculture, and to a lesser extent growth of services, is associated with poverty reduction, along with lower levels in the real price of food. Agriculture and services are both labor-intensive sectors. The \growth of output in these sectors increases the demand for unskilled labor, the principal income source for most poor people. An increase in agricultural output simultaneously raises the return to land and a surprisingly large number of poor rural people also own land. Finally, part of the effect of an increase in agricultural output operates through a reduction in food prices, also strongly associated with poverty reduction.

6. Conclusions

The nations of Southeast Asia have achieved significant reductions in poverty incidence in recent decades. The achievement of poverty reduction was overwhelmingly attributable to the high rate of growth of GDP per person, but changes in the sectoral composition of the growth also had an impact. The results confirm that the poverty reduction outcome was strongly related to the growth of agriculture and services, but not to the growth of industry. The results also indicate that reductions in the real price of food contribute significantly to poverty reduction. Increases in the real price of food do the opposite.

The importance of agricultural development for poverty reduction is widely recognized, but the contribution of the services sector is larger and its role has been much less widely appreciated. Perhaps surprisingly, the results indicate that the growth of industry has not contributed to poverty reduction in Southeast Asia. Similar results have been obtained using data for India (Ravallion and Datt 1996), except that in the case of India the negative effects of industrial growth were stronger. On the other hand, earlier results for Taiwan (Warr and Wang 1999) showed that the growth of industry was strongly associated with poverty reduction.

These differences may be due to the role of industry policy. Taiwan's more outward-oriented trade policy apparently induced a form of industrial development that was labor-intensive, small-scale and with a large rural component. This pattern of

industrialization was conducive to a massive reduction in the incidence of poverty, occurring in both rural and urban areas. In India, the heavy protection of industry led to a capital intensive, large-scale and urban-based pattern of industrial development, which did not serve the interests of the poorest groups. The Southeast Asian economies studied here represent an intermediate between these two extreme cases, in so far as industry policy is concerned, and the estimated results on the poverty impact of industrial growth are intermediate as well.

The principle income source of poor people is their own labor - largely unskilled. Agricultural land is also an important asset for some people experiencing financial hardship, but to a much lesser degree. Development which increases the demand for these two resources raises the incomes of poor people and consequently diminishes the incidence of poverty. This presumably explains the differences in the poverty-reducing power of growth in different sectors of the economy which have been analyzed in this paper. In the four Southeast Asian countries studied here, considered as a group, the growth of the agricultural and services sectors have each led to considerable reductions in poverty. The growth of the industrial sector has not. The results support the hypothesis that an import-substitution based industry policy promotes a pattern of industrialization which does not advance the welfare of poor people because it contributes insufficiently to expanding the demand for the principal resource which they own – unskilled labor.

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