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Patterns of Inclusive Growth in Developing Asia: Insights from an Enhanced Growth-Poverty Elasticity Analysis

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Abstract

The primary objective of this research is to identify key factors that explain the observed wide variation in patterns of inclusiveness of economic growth—defined here as gross domestic product (GDP) growth that leads to significant poverty reduction—in Asia. In exploring this relationship, this study goes beyond defining poverty by the income or expenditure yardstick alone, but examines a more holistic measure of poverty that considers its multidimensional nature. Factors that influence the degree of poverty reduction that accompanies economic growth (herein referred to as the poverty elasticity of growth or PEG) include the sectoral composition of the economy and its growth; the nature, size, and pattern of public investments (particularly on social services and agriculture); and quality of governance. As construction of a consistent panel data set was beyond the time constraints for the study, PEG is calculated for Asian countries as an arc elasticity over the 1990–1996 and 2000–2006 periods, and analyzed against available measures of the above-named factors from statistics compiled by the Asian Development Bank (ADB), World Bank, and the United Nations Development Programme (UNDP). Pairwise analyses using scatterplots, simple regressions, and multiple regressions were employed to determine systematic relationships between the PEG and its likely determinants. Results affirmed the significant impact of quality of governance, public expenditures on social services, and contribution of agriculture to GDP growth, in that order of importance. There is likewise evidence that manufacturing growth has had a bearing on the inclusiveness of growth, especially in Southeast Asia in recent years. Results of the analysis also showed how dramatic differences in characterization of countries can result when a multidimensional poverty measure is employed rather than a unidimensional one based only on income or expenditure. This points to the need for a more holistic view and assessment of poverty when using it as a guide for various development interventions.

JEL Classification: O11, O15, O20, O53

Contents

1. INTRODUCTION

Around the world, the general experience is for economic growth to be accompanied by falling poverty.[1] And nowhere has this been truer than in Asia, where data clearly indicate that poverty reduction associated with economic growth has actually been stronger than elsewhere in the world. Some put the association more strongly and assert that economic growth *leads to* or even causes reduction in poverty, on which basis it is argued that the best way to reduce poverty in the long run is to pursue economic growth.

This research was motivated by the widely differing patterns of economic growth and accompanying poverty reduction observed across Asia and between Asia and the rest of the world, especially given the perverse experience in certain countries where poverty incidence has risen with economic growth—as seen recently in the Philippines, for example. The primary objective is to identify key factors that explain this wide variation in patterns of the inclusiveness of economic growth (including lack thereof). Inclusive growth is defined in the context of this research as gross domestic product (GDP) growth that leads to significant poverty reduction. In exploring this relationship, this study goes beyond defining poverty by the income or expenditure yardstick alone, but examines a more holistic measure of poverty that considers its multidimensional nature.

Factors that influence the degree of poverty reduction that accompanies economic growth—or what has been referred to as the poverty elasticity of growth (PEG),[2] the term we will use in this paper—may include the sectoral composition of the economy and its growth (and thus the economic policy environment that leads to it); the nature, size, and pattern of public investments (including on social services and rural infrastructure); and nature of governance, including voice and accountability, rule of law, control of corruption, etc.).

In exploring the growth-poverty reduction relationship in Asia, this study set out to undertake the following:

1. Explore practical multidimensional indicators of poverty to account for its non-income dimensions in analyzing the experience of Asian countries;
2. Determine similarities and differences in the pattern of economic growth and poverty reduction (measured multidimensionally as above) in Asian countries;
3. Identify groups of Asian economies that have exhibited strong, weak, and negative correlation between economic growth and poverty reduction;
4. Determine common factors within each of these groups and differences across them that may explain differences in the growth-poverty outcomes, with particular focus on:
   - sectoral composition of growth
   - nature of governance
   - nature, size, and pattern of public investments
5. Explore systematic relationships between the above explanatory factors and growth-poverty outcomes; and
6. Derive lessons to guide directions for policy and public investments in Asian countries, particularly in the face of the ongoing global financial crisis and economic downturn.

[1] Dollar and Kraay (2001) is probably the most widely cited empirical analysis on this issue.

[2] Among others, Sumner (2003), in his scan of 50 years of literature on the subject, used this term and acronym; others refer to it as the growth elasticity of poverty reduction (e.g., Bourguignon 2003).

Section 2 examines the state of knowledge on both the growth-poverty linkage in Asia and measurement of multidimensional poverty. Section 3 presents calculated PEGs for Asian countries and examines differences in results across the two decades (1990s and 2000s) and between alternative measures of the poverty variable. Graphical and quantitative analysis is done in Section 4 on the available data to determine systematic relationships between plausible explanatory factors and the size of PEG. Section 5 summarizes the key observations and implications emerging out of the graphical and numerical analysis. The paper ends with conclusions and directions for policy and further research.

2. GROWTH-POVERTY LINKAGE AND MULTIDIMENSIONAL POVERTY: WHAT DO WE ALREADY KNOW?

2.1 Poverty, Inequality, and Growth in Asia

The relationship between income growth and poverty reduction has been shown to be particularly stronger in developing Asia. Analysis of data from 51 developing countries around the world led to the observation that growth of 1% in average income is associated with a 1.5% decline in the incidence of US$1-a-day poverty on average, with growth explaining 57% of the variation in changes in poverty (Asian Development Bank [ADB] 2004). Interestingly, when the sample is limited to countries in East, Southeast, and South Asia, each 1% income growth is associated with 2% decline in poverty incidence, with 65% explanatory power. In other words, the data suggest that *growth has served the poor better in Asia than elsewhere in the developing world*. Ferreira and Ravallion (2008), in reviewing the evidence on levels and recent trends in global poverty and income inequality, similarly pointed to the dominant role of Asia in accounting for the bulk of the world's poverty reduction since 1981.

This observation masks a wide variation in experience among Asian countries, however. Official data in the Philippines, for example, indicate a perverse growth-poverty reduction experience: poverty incidence actually rose by 3% from 2003 to 2006, a period when the economy was reported to have enjoyed historically high rates of growth (National Statistics Office 2006, 2008). In this case, the growth-poverty reduction elasticity is actually positive, where rising GDP is associated with rising poverty. The Philippine experience, while unusual in the region, is not necessarily unique. Data show that Mongolia and Sri Lanka had also experienced rising poverty incidence within the 2002–2008 period.[3] These perverse trends in Mongolia, Philippines, and Sri Lanka are indicative of the wide range that actual experience in countries even from within the same region can span.

The economic development literature is already replete with studies that have examined the linkages among poverty, inequality, and growth (referred to in the literature with the acronym PIG; see Sumner 2003), and the poverty elasticity of growth (PEG). There is also a growing body of literature on multidimensional poverty and its measurement. This study draws from both threads of work as it seeks to enrich the PEG analysis in the context of developing Asia.

2.1.1 PIG and PEG: Past Assessments

Dollar and Kraay (2001), in two related pieces of work (Dollar and Kraay 2001 and 2001a) provoked wide debate on the supposed empirical relationship they found between income and poverty reduction. The debate was not so much on the linkage itself, but on the inferred

[3] Mongolia had a rise in income poverty within the 2002-2008 period. While Sri Lanka had declining income poverty, its Human Poverty Index (HPI-1) reported by the UNDP rose within the period, which was reported at 17.6 in 2002, but had risen to as much as 18.3 before settling at 17.8 in 2007–2008.

reasons for the linkage. They found, based on data from 92 countries spanning four decades that average incomes of the poorest fifth of society rise proportionately with average incomes. They also found that several determinants of growth—such as good rule of law, openness to international trade, and developed financial markets—benefit the poorest fifth of society as much as everyone else. They further found little evidence of the effects of several factors commonly thought to disproportionately benefit (i.e., be "biased" for) the poorest in society. All this led to the conclusion declared unequivocally in their title, i.e., that growth is good for the poor.

Numerous other critics (most of whom tended to focus on their other work relating trade openness to growth; see for example Rodrik 2000, Amann et al. 2002) pointed out the lack of theoretical structure supporting the specification of the Dollar/Kraay equations. They also questioned the validity of using income of the lowest quintile as indicator of poverty, and cited the difficulties in drawing conclusions from large cross-section samples, with attendant problems of data quality. They found the strong correlation between average per capita income and income of the lowest quintile to be robust, but warned that (i) a similarly strong result is also found for the higher quintiles, and (ii) the significance of the other Dollar/Kraay regressors changes dramatically under different samples and equations. Thus, they argued that the policy prescriptions associated with the Dollar and Kraay regressions cannot be sustained.

Azis (2002, 2008) has been similarly critical of studies on growth and poverty that fail to explain the mechanisms of how the former affects the latter. Using a computable general equilibrium analysis, he focused on the poverty impacts of the 1997–1998 Asian financial crisis in Indonesia (Azis 2002). Among his observations derived from the analysis, he found that the impacts of prices on poverty were far more significant than the impacts of income changes during the crisis. He also undertook a combined supply-aggregate demand analysis on Indonesia and Thailand to examine the impact of macroeconomic policies on poverty, and found differing poverty responses to positive fiscal shocks between the two countries.

Ferreira and Ravallion (2008) examined the statistical relationships between growth, inequality, and poverty and the correlation between inequality and the growth elasticity of poverty reduction. From an extensive examination of international datasets, they observed: (i) the absence of a correlation between growth rates and changes in inequality among developing countries, (ii) the strong (positive) correlation between growth rates and rates of poverty reduction, and (iii) the importance of inequality to that relationship.

In an extensive review of the growth, inequality, and poverty linkages in Asia, Quibria (2002) derived a number of empirical regularities: (i) a robust association between sustained growth and poverty reduction; (ii) no robust correlation between inequality and aggregate growth; (iii) rapid capital accumulation was the most important proximate cause of the "East Asian miracle"; (iv) initial conditions varied (widely) among the miracle economies, and were thus not the crucial factors for the economic dynamism of the region; and (v) regardless of conditions of political freedom (i.e., whether autocratic or more democratic), provision of critical economic freedoms and a structure of market-supporting institutions were common to the miracle economies.

Bourguignon (2002a) pointed out that many empirical cross-country studies on the growth-poverty linkage are based on linear regression models that are ill-specified because they fail to recognize the identity that links the rate of economic growth, the speed of poverty reduction and changes in the distribution of income, as follows:

$$\Delta H = H_{t'} - H_t = \left[\widetilde{F}_t\left(\frac{z}{\overline{y}_{t'}}\right) - \widetilde{F}_t\left(\frac{z}{\overline{y}_t}\right) \right] + \left[\widetilde{F}_{t'}\left(\frac{z}{\overline{y}_{t'}}\right) - \widetilde{F}_t\left(\frac{z}{\overline{y}_{t'}}\right) \right] \quad (1)$$

where H is the headcount poverty index, F is the cumulative distribution function, z is the poverty line, y is income per adult equivalent (ỹ being the mean income), and subscripts t and t' refer to two distinct points in time. It is an identity because it simply restates the definition of the change in poverty $\Delta H = H_{t'} - H_t = F_{t'}(z/y_{t'}) - F_t(z/y_t)$, wherein $F_t(z/y_{t'})$ was simply added and subtracted on the right hand side. In this form, the first term on the right hand side of expression (1) gives a proportional change in all incomes that leaves the distribution of relative income unchanged (the "growth effect"), and the second term is change in the distribution of relative incomes, which is independent of the mean (the "distributional effect"). The identity implies that income redistribution reduces poverty in two ways. First, a permanent redistribution of income reduces poverty instantaneously through the above "distribution effect." But in addition, it also contributes to a permanent increase in the poverty elasticity of growth, and therefore to *an acceleration of poverty reduction* at any given rate of economic growth. This is to be distinguished from findings in the literature that growth tends to be faster where there is less inequality. Such findings would suggest that redistribution policy offers a "double dividend" of accelerating both growth itself, and the speed at which such growth leads to poverty reduction.

2.1.2 Explaining Cross-Country Differences in Outcomes

Much has been written about the Asia-Pacific region's success in poverty reduction amid rapid economic growth. In Chaterjee's (2005) survey of the literature, two broad classes of factors were examined: those explaining the phenomenal increase in economic growth and its relation to poverty reduction, and policies directly aimed at fostering inclusiveness of the development process. The experience in East and Southeast Asia differs from that of South Asia, with the latter having reaped the poverty reduction dividend of growth somewhat later, and having experienced less employment growth than the former. Chaterjee observed that labor-absorbing growth, land reform, microfinance, control of inflation, and human capital investments are important elements in pursuing inclusive growth.

It has been argued that the sectoral composition of output and source of output growth in the economy has an important bearing on the inclusiveness of growth, i.e., the poverty reduction effect of such growth. Because rural poverty tends to dominate the poverty scene in most countries, it is widely presumed that growth in the agricultural sector is key to attaining poverty-reducing growth. Hasan and Quibria (2004) showed that the sectoral growth effects in the growth-poverty linkage vary considerably across regions of the developing world. They thus cautioned against misplaced "agricultural fundamentalism," or the argument that economic growth biased for agriculture will promote poverty reduction most rapidly. In their findings, the strong poverty-reducing effect of agricultural growth vs. industry and services growth is true mainly for East Asia, whereas the opposite is true in South Asia, especially India, where manufacturing growth has historically had the strongest poverty-reducing effect. Thus, while the sectoral composition of growth would have an important influence on poverty reduction outcomes of economic growth, the sectoral growth driver that matters could vary across regions.

Public expenditures, particularly on health and education, are also widely expected to have a major bearing on human development, and therefore on poverty outcomes in growing economies. However, ADB (2006) indicated that the empirical evidence on this is mixed. Anand and Ravaillon (1993), Bidani and Ravaillon (1997), and Self and Grabowski (2003), among others, found public expenditures to be a significant determinant of health outcomes, especially for the poor, and particularly in low- to middle-income countries. Baldacci, Guin-Siu, and De Mello (2003) similarly established a strong link between public spending and education outcomes.

On the other hand, Carrin and Politi (1996) and Filmer and Pritchett (1999) found no significant impact of public spending on health outcomes. Landau (1986) and Al-Samarrai (2002) likewise ascertained the weak correlation between public spending and education outcomes. The latter suggested that levels of household spending, the effectiveness of the

public expenditure management system, and the composition of public education spending are important factors explaining this weak link. Notwithstanding these mixed findings, ADB (2006) warned against dismissing the importance of public expenditures for poverty reduction, and explored methodological reasons why the link appears weak in some past analyses. It is pointed out that these results should not be taken to imply that resources are unnecessary, but that increasing resources alone is unlikely to be sufficient. The composition of resources and institutions that govern the use of these resources plays a key role in translating resources into better health and education outcomes.

To derive implications for aid policy, Agenor, Bayraktar, and El Aynaoui (2005) developed a macroeconomic framework to capture linkages between aid, public investment, growth, and poverty. Public investment is disaggregated into education, infrastructure, and health, and affects both aggregate supply and demand. In their application of the model to Ethiopia, they concluded that the required increase in foreign assistance could be sizable if the elasticity of poverty with respect to growth is small, despite the positive externalities generated by aid.

Nature or quality of governance is another factor expected to have an effect on the growth-poverty reduction relationship. Quibria (2006) examined the relationship between governance and economic growth using the World Bank governance indicators developed by Kaufman and Kraay (2002, 2008) and associates. He found a seemingly paradoxical result that for developing Asia, countries that exhibit deficits in their governance indicators register on average a much higher growth on a sustained basis compared to those that exhibit a surplus. He conjectured that either the link between governance and economic performance is not as strong or immediate as is widely presumed, or the Kaufman-Kraay composite governance index fails to capture the nuances of governance-growth interactions. Quibria's analysis was confined to the governance-growth relationship, and stopped short of examining the relationship with poverty reduction aspect or inclusiveness of growth.

A measurable indicator for empowerment, as an aspect of governance, was devised by Alsop (2005), who examined evidence of the relationship between empowerment and poverty outcomes from five country case studies. She concluded, however, that while a unifying analytic framework can work in different settings, there is a need for contextual sensitivity when attempting to measure empowerment. Thus, considerable caution is required in developing a measure of empowerment that would permit cross-country comparisons.

As a related concept, Bjornskov (2007) found that the political ideology of incumbent governments influences the link between growth and inequality. That is, under left-wing governments, inequality is negatively associated with growth, while the association is positive under right-wing governments.

Son and Kakwani (2008) analyzed pro-poor growth in 80 countries and proposed a new measure of pro-poor growth that captures gains and losses of growth rates due to changes in distribution of consumption (with gains implying pro-poor growth, losses anti-poor growth). They found regional location of countries to have a bearing on the degree of "pro-poorness" of growth. A low inflation rate was found to be a significant contributor to pro-poor growth, while the effects of share of agriculture to GDP, openness to trade, and rule of law were found to be insignificant.

In their examination of poverty and income across provinces in the People's Republic of China (PRC), Chambers, Wu, and Yao (2008) found an inverted U-shaped relationship (i.e., poverty rises with income at lower income levels, but the opposite is true at higher income levels). Prior growth performance was found to be a dominant factor influencing this relationship, with many traditional poverty explanatory variables found to have weaker explanatory power after taking account of prior growth.

2.2 Measuring Multidimensional Poverty

Discussions on inclusive growth have increasingly moved toward a broader definition of poverty to reflect its widely acknowledged multidimensionality. Beyond lack of income (exemplified in the common yardsticks of US$1 per day—recently updated by the World Bank to US$1.25 per day—and US$2 per day), non-income quality of life indicators such as health and education are rightfully receiving as much attention in more recent poverty analyses.

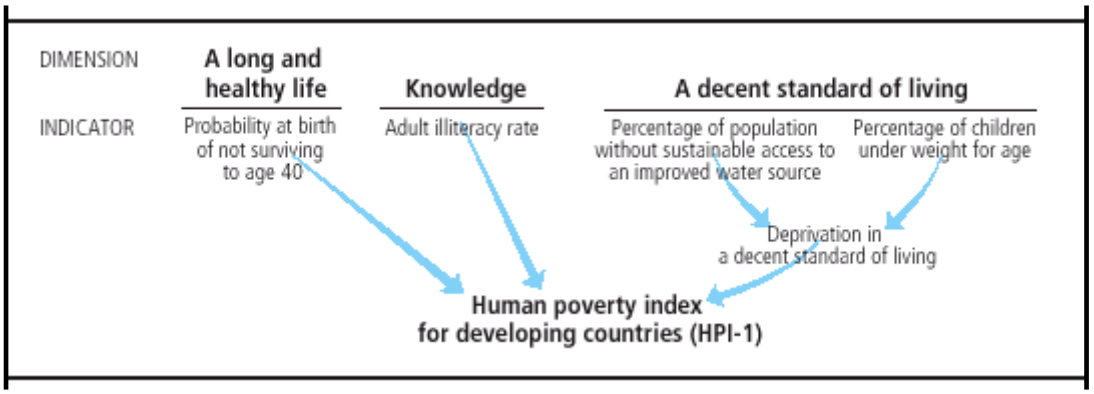
Sumner (2003), in his stocktaking of almost 50 years of literature on poverty, inequality, and growth spanning Lewis (1954) to Dollar and Kraay (2002), cited a number of studies that examined non-income poverty dimensions in relation to economic growth. Barro and Sala-I-Martin (1995) and Pritchett and Summers (1995) argued that growth is good for the improvement of health, while Barro and Lee (1997) showed that growth is good for education. Thomas et al. (2000) argued that countries with average annual GDP per capita growth of over 2.3% have had faster poverty reduction by various measures. However, several authors have been more cautious. Easterly (1999) noted that in only 10 of 81 cases were quality of life indicators positively linked to economic growth. Foulkes (2003) grouped countries into five types by GDP per capita and found that the countries with the fastest growth were not the same as those with the fastest improvement in life expectancy. In fact, life expectancy improved at the same rate (an average of 0.5% a year) in both those countries with the fastest economic growth (an average of 5.0% a year) and those with the lowest (negative) growth rates (an average of -0.3% a year). The United Nations Development Programme (UNDP) (1996) argued that 1% of redistribution was seven times more successful in improving the infant mortality rate than 1% of growth.

The UNDP's Human Development Index (HDI) is probably the most widely recognized and used composite measure embodying other welfare dimensions (i.e., on health and education) apart from income. Starting in 1998, UNDP also began releasing estimates of a Human Poverty Index, a measure closely related to the HDI.[4] The approach to measurement of the HPI is illustrated in Figure 1. Since 1998, ADB has routinely reported HPI for its developing member countries in its annual publication *Key Indicators of Developing Asian and Pacific Countries*. Apart from HPI, there is a growing body of literature on the measurement of multidimensional poverty, which potentially provides possibilities for even richer alternative measures that capture more of the poverty dimensions as available data may permit.

The economic literature has advanced considerably in the formulation and application of multidimensional poverty measures (Bourguignon and Chakravarty 2002, 2003). Silber (2007) provides a comprehensive survey of the conceptual approaches to measuring poverty with a multidimensional perspective (see also Kakwani and Silber 2008).

[4] HPI in effect measures deprivation of welfare as measured by the HDI.

Figure 1: The Human Poverty Index for Developing Countries



A prior question concerns the choice of poverty dimensions to assess. Alkire (2008) suggested five possible bases for selecting the dimensions:

- Data availability or an authoritative convention
- Implicit or explicit assumptions made by the researcher
- "Public consensus" (e.g., list of Millennium Development Goals or MDGs)
- Deliberative participatory processes
- Empirical evidence concerning people's values

While the UNDP's HDI combines education (basic literacy, and later, school enrollment rates) and health (life expectancy) dimensions with the economic dimension (per capita GDP), Allardt (1993) took a slightly different perspective and identified three dimensions simply defined as Having, Loving, and Being. Ramos and Silber (2005) attempted to implement the Allardt approach using the British Household Panel Survey, further defining subdimensions and corresponding indicators for the three dimensions as follows:

- Having – reflected in economic resources, housing, employment, working conditions, health, and education
- Loving – reflected in degree of satisfaction with social life (family, friends, etc.)
- Being – reflected in self-determination, political empowerment, leisure activities, opportunities to enjoy nature, and work satisfaction

Asselin (2005) applied multiple correspondence analysis (MCA) to the measurement of multidimensional poverty involving two steps. A composite indicator is first constructed from multiple primary poverty indicators, before proceeding with computation of poverty indices with the composite indicator. MCA is resorted to after explaining the limitations of the more popular approach of Principal Components Analysis (PCA).

However, introducing multidimensionality gives rise to more practical challenges in defining who are poor and nonpoor. One approach is to define a poverty threshold for the various non-income dimensions, then aggregating the dimensions, and finally aggregating across individuals (Chakravarty, Mukherjee, and Ranade 1998; Bourguignon and Chakravarty 2003; Chakravarty, Deutsch, and Silber 2005). The other way is to reverse the latter two steps, i.e., first define a poverty threshold for the various non-income dimensions, then aggregate across individuals before aggregating the dimensions. This is the approach adopted by the Fuzzy Approach to multidimensional poverty assessment, applying the mathematical theory of fuzzy sets (Zadeh 1965) to address the difficulty of defining who belong or do not belong to the "poor" category upon aggregating the poverty dimensions. Betti and Lemmi (2006) surveyed various implementations applying such approach, including the work of Deutsch and Silber (2006) applying the method to Israeli Census data.

Apart from those already cited above, various other authors have attempted to devise measures of multidimensional poverty and apply them to actual data from different countries. Costa (2003) compared a unidimensional approach based on the traditional income yardstick with a multidimensional one that incorporates economic, social, demographic, and cultural factors using data from 12 European countries.[5] She concludes that an income-based evaluation of poverty misses substantial insights that may be gained from a multidimensional assessment. Similarly, Dekkers (2003) applied a multidimensional measure using the European Community Household Panel (ECHP) data and found, among other things, that poverty rates based on income alone often overstate poverty (i.e., are often higher than rates based on a multidimensional measure). However, he also finds that for certain groups, particularly single parents and those with precarious health situation, their poverty risk is underestimated by the unidimensional measure based on income alone.

Notwithstanding the growing body of literature that has emerged, implementing a multidimensional poverty measure remains inherently difficult and data intensive. While it has been possible to devise and implement more comprehensive multidimensional poverty indicators for individual countries or groups of countries where detailed survey data are available, the UNDP's HPI is by far the only multidimensional poverty indicator available for use for cross-country analysis.

One can thus determine the numerical relationship between economic growth and such a broader poverty measure, thereby enriching the usual PEG analyses. The practical value of employing a more holistic poverty measure in such analysis lies in its policy usefulness to governments and development partners. Among other things, such enriched analysis could provide more focused guidance for strategies, policies, public investments, and operational frameworks for interventions to achieve inclusive growth and poverty reduction.[6] It is also interesting to examine and compare differences in results obtained from using the limited income/expenditure-based definition of poverty and those obtained from using a more holistic one. With the latter being considered as a more appropriate basis for assessing inclusiveness of growth, this comparison would give an indication of the inadequacy of the income/expenditure-based poverty yardstick in assessing inclusive growth and pursuing it effectively.

2.3 Sources of Data

The analysis undertaken for this study requires compilation of relevant data across Asian countries and across time, to permit examination of trends in economic growth and poverty reduction, and in factors that influence their relationship. Of particular interest were data and indicators that could permit formulation and/or use of a multidimensional measure of poverty.

The following data series were useful sources of cross-country time series data for use in the analyses:

1. Country Tables in the ADB annual publication Key Indicators of Developing Asian and Pacific Countries.
2. Statistical Appendices to the ADB's annual Asian Development Outlook.
3. Statistical Appendices to the UNDP's annual Human Development Reports
4. Statistical Appendices to the World Bank's annual World Development Reports

[5] What she refers to as "cultural" indicators actually refer to attributes of the home, such as nature of heating, presence of bath or shower, presence of flushing toilet, level of education, etc.

[6] As Azis (2002) asserts, to conclude and recommend that "growth contributes positively to poverty reduction" is of not much use to policymakers…. (Such) studies do not really explain the mechanisms of how growth affects poverty…."

In addition, the World Bank's Worldwide Governance Indicators data set has been used in examining the effects of governance on the growth-poverty linkage. Because these international data sets take time to compile and process into a form suitable for cross-country comparison, there is a time lag of 2–3 years in the reported data sets. Hence, the most recent year for income and poverty data has been 2006, while the country governance indicators are available up to 2007. Qualitative information on the Asian economies studied have also been obtained from various ADB publications and other relevant publications.

While it would have been ideal to construct an Asian panel data set that would include a combination of time series and cross-country data, the varying frequencies of observations for different relevant variables precluded doing so within the time constraints of this study. For example, while the World Bank governance indicators are estimated annually, the HPI is not and is updated at varying frequencies across countries. Still, a consistent panel data set that includes multiple (if not annual) observations per country could have permitted much fuller regression analyses than has been possible here, including in the estimation of the PEGs, rather than the arc elasticity approach undertaken here. Such fuller quantitative analysis is left for future work.

3. INCLUSIVE GROWTH IN ASIA: THE RECENT RECORD

The basic economic growth and poverty reduction data assembled and used for this analysis are given in Tables 1 and 2. Comparable data were available for only 10 Asian countries for the period 1990–1996, while data for 15 Asian countries were assembled for the period 2000–2008. The analysis was undertaken for these two intervals, and excluded 1997–1999 due to a discontinuity in some datasets in 1997–1998. In particular, the format and nature of variables reported in the detailed statistical tables accompanying the UNDP Human Development Report underwent changes in these years. Nonetheless, the abnormal conditions brought about by the East Asian financial crisis in those years may provide a good reason to omit that crisis period from the trend analyses.

3.1 Reduction in Income Poverty with Growth, 1990–1996

Table 1 reflects poverty data in 1990–1996 as income poverty headcount for both rural and urban areas (except for the PRC where urban poverty data were not reported), derived from the annual UNDP Human Development Reports. The table relates poverty reduction with average annual real GDP growth rates computed from data compiled in the 2008 ADB Key Indicators for Asia and the Pacific. Because estimates of the HPI were not available before 1998, the analysis for the period 1990–1996 could only be undertaken using the traditional income poverty measure.

Based on rate of rural poverty reduction with economic growth, Bangladesh, Indonesia, and Republic of Korea (hereafter Korea) emerge as the Asian countries where income growth was accompanied by the strongest poverty reduction in the 1990–1996 period. Their respective PEGs indicated an elastic response of poverty reduction to economic growth, with poverty declining more than 1% for every 1% of GDP growth (i.e., magnitude of PEG>1). Nepal and the Philippines were also relatively strong performers during the period, with poverty declining commensurately with economic growth (i.e., PEG magnitudes close to unity). Malaysia was a moderate performer, while India, Pakistan, PRC, and Thailand had slowest progress, with the last two actually showing rising rural poverty during the period, and therefore having positive PEGs.

The Thailand experience in this period is noteworthy given the relatively rapid pace of economic growth it experienced in that period. It was apparently this perceived weakness of progress on poverty reduction accompanying such rapid growth that spurred the Thai government to highlight social development starting with its 8th National Economic and

Social Development Plan for 1997–2001. The Eighth Plan "introduced a new paradigm in Thailand's national development to recognize human beings as the center of development. Focus (is) on holistic development of human potentials in physical, intellectual, and spiritual aspects, including popular participation of all development partnerships for the sake of self-sufficiency at community and local levels" (Boonchit and Natenuj 1998).[7] By the Ninth Plan, the Thai government had begun referring to their 5-year development plans as the National Social and Economic Development Plan, to emphasize the primacy of the social over the economic dimension of development.

[7] Boonchit, Wichayayut and Sununtha Natenuj. 1998. The Eighth National Economic and Social Development Plan and Current Economic Adjustment. National Economic and Social Development Board Economic Research Institute (ERI) Working Paper No. 64. Bangkok: ERI.

Table 1: Poverty Elasticity of Growth Based on Income Poverty Headcount and Average Annual GDP Growth (%), 1990–1996

Country	Ave GDP Growth 90–96	Poverty, Rural			Poverty, Urban			Elasticity	
		1990	1996	% Red.	1990	1996	% Red.	Rural	Urban
Bangladesh	**4.6**	86	51	-40.70	86	56	-34.88	**-1.475**	-1.264
Republic of Korea	**7.9**	11	4	-63.64	18	5	-72.22	**-1.343**	-1.524
Indonesia	**8.0**	44	16	-63.64	26	20	-23.08	**-1.326**	-0.481
Nepal	**5.2**	61	43	-29.51	55	19	-65.45	**-0.946**	-2.098
Philippines	**2.8**	64	54	-15.63	50	40	-20.00	**-0.930**	-1.190
Malaysia	**9.5**	38	23	-39.47	13	8	-38.46	**-0.693**	-0.675
Thailand	**8.6**	34	29	-14.71	15	7	-53.33	**-0.285**	-1.034
India	**5.6**	51	49	-3.92	40	38	-5.00	**-0.117**	-0.149
Pakistan	**5.1**	29	31	6.90	32	20	-37.50	**0.225**	-1.225
PRC	**10.7**	10	12	20.00	NA	NA	NA	**0.312**	NA

Sources: Poverty Data – UNDP Human Development Reports

GDP Growth – ADB Key Indicators of Developing Asian and Pacific Countries

3.2 Improvement in Income-Based and Multidimensional Poverty, 2000–2008

Table 2 looks at the 2000–2006 period, and derives PEG based on income poverty using the US$1.25-a-day yardstick (World Bank 2008), and average annual GDP growth rates derived from data compiled in the ADB Key Indicators series. Wider availability of comparable country data after 2000, including on the UN's multidimensional HPI, makes possible the inclusion of 15 countries in the analysis of the period 2000–2008.

The strongest performers in this more recent period are Indonesia, Pakistan, and PRC, all with elastic poverty reduction responses to economic growth. Malaysia, Thailand, and Viet Nam are also strong performers, with PEGs exceeding 0.6. Bangladesh, Nepal, and Sri Lanka had moderate reductions in income-based poverty with economic growth, while Cambodia, India, Mongolia, and the Philippines had the weakest performance, with the last two actually seeing an *increase* in poverty even as their economies grew.

Table 2: Poverty Elasticity of Growth Based on Income Poverty Headcount and Average Annual GDP Growth, 2000–2006

Country	Pop Below US$1.25 a Day (%), Before	Pop Below US$1.25 a Day (%), After	Period	GDP Growth in Period	PEG
Indonesia	29.3	21.4	2002–2005	16.32	**-1.652**
Pakistan	35.9	22.6	2002–2005	22.65	**-1.636**
PRC	28.4	15.9	2002–2005	33.70	**-1.306**
Malaysia	1.9	1.5	1997–2004	26.12	**-0.806**
Thailand	1.9	1.7	2002–2004	13.94	**-0.755**
Viet Nam	24.2	21.5	2004–2006	17.37	**-0.643**
Sri Lanka	16.3	14.0	1996–2002	24.10	**-0.586**
Nepal	68.4	55.1	1996–2004	37.78	**-0.515**
Bangladesh	57.8	49.6	2000–2005	30.27	**-0.469**
Cambodia	48.6	40.2	1994–2004	109.48	**-0.158**
India	49.4	41.6	1994–2005	100.67	**-0.157**
Philippines	22.0	22.6	2003–2006	17.68	**0.154**
Mongolia	15.5	22.4	2002-2005	24.00	**1.855**
Singapore	NA	NA	2000–2006	33.08	NA
Myanmar	NA	NA	2001-2006	85.55	NA

Sources: Poverty Data – World Bank World Development Indicators 2008 Poverty Supplement

GDP Growth – ADB Key Indicators of Developing Asian and Pacific Countries

Table 3 compares the PEG rankings based on income poverty between the two periods, and shows deterioration in the performance of Bangladesh, Nepal, and the Philippines, with the Philippines (along with Mongolia) falling into a perverse trend of rising poverty even with a growing economy (hence PEG>0). On the other hand, there was a dramatic turnaround in the performance of Pakistan and the PRC, both of which moved from positive (i.e., perverse) PEGs in the 1990s to elastic PEGs with the right sign in more recent years.

Table 3: PEG Rankings in 1990–1996 and 2000–2006

Country	PEG (Income) 1990–1996	PEG (HPI) 2000–2006	Country
Bangladesh	-1.475	-1.464	Malaysia
Republic of Korea	-1.343	-1.231	Singapore
Indonesia	-1.326	-1.190	Thailand
Nepal	-0.946	-1.181	Viet Nam
Philippines	-0.930	-1.021	Nepal
Malaysia	-0.693	-0.901	Mongolia
Thailand	-0.285	-0.791	PRC
India	-0.117	-0.583	Cambodia
Pakistan	0.225	-0.547	Pakistan
PRC	0.312	-0.489	Philippines
		-0.373	Bangladesh
		-0.322	India
		-0.292	Myanmar
		-0.284	Indonesia
		-0.130	Sri Lanka

The PEGs computed on the basis of a multidimensional poverty indicator (HPI-1) for the Asian countries are shown on Table 4. With poverty measured multidimensionally using the HPI, the strongest performers in poverty reduction with economic growth in recent years have been Malaysia, Singapore, Thailand, and Viet Nam. These countries had elastic responses (PEG>1), indicating a more than proportionate reduction in the multidimensional HPI for every 1% rise in real GDP. Nepal had a near-unitary elasticity, while Cambodia, Mongolia, Pakistan, and PRC also had PEGs exceeding 0.5 in absolute value. Poverty reduction accompanying economic growth was relatively weak in the Bangladesh, India, and the Philippines, and was weakest in Indonesia, Myanmar, and Sri Lanka. Between 2000 and 2005, the Philippines and Sri Lanka actually saw a rise in poverty as measured by the HPI-1.

Table 4: Poverty Elasticity of Growth Based on Human Poverty Index and Average Annual GDP Growth, 2000–2006

Country	Human Poverty Index (HPI-1)			Reduction				Ave. Annual GDP Growth (%)	Elasticity (PEG)	
	2000	2005	2006	2000–2005	% Change	2000–2006	% Change		2000–2005	2000–2006
Malaysia	12.6	8.3	6.4	4.3	-34.1	6.2	-49.2	5.6	-1.22	**-1.46**
Singapore	6.5	5.2	4.1	1.3	-20.0	2.4	-36.9	5.0	-0.80	**-1.23**
Thailand	14.0	10.0	9.0	4.0	-28.6	5.0	-35.7	5.0	-1.14	**-1.19**
Viet Nam	27.1	15.2	12.5	11.9	-43.9	14.6	-53.9	7.6	-1.16	**-1.18**
Nepal	43.4	38.1	33.3	5.3	-12.2	10.1	-23.3	3.8	-0.64	**-1.02**
Mongolia	19.4	16.3	13.0	3.1	-16.0	6.4	-33.0	6.1	-0.52	**-0.90**
PRC	14.9	11.7	7.9	3.2	-21.5	7.0	-47.0	9.9	-0.43	**-0.79**
Cambodia	43.3	38.6	28.9	4.7	-10.9	14.4	-33.3	9.5	-0.23	**-0.58**
Pakistan	41.0	36.2	33.6	4.8	-11.7	7.4	-18.0	5.5	-0.43	**-0.55**
Philippines	14.6	15.3	12.5	-0.7	4.8	2.1	-14.4	4.9	**0.20**	**-0.49**
Bangladesh	42.4	40.5	36.9	1.9	-4.5	5.5	-13.0	5.8	-0.15	**-0.37**
India	33.1	31.3	28.5	1.8	-5.4	4.6	-13.9	7.2	-0.15	**-0.32**
Myanmar	27.2	21.5	21.0	5.7	-21.0	6.2	-22.8	13.0	-0.32	**-0.29**
Indonesia	18.8	18.2	17.2	0.6	-3.2	1.6	-8.5	5.0	-0.13	**-0.28**
Sri Lanka	17.6	17.8	16.9	-0.2	1.1	0.7	-4.0	5.1	**0.04**	**-0.13**

Sources: Poverty Data – UNDP Human Development Reports

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Table 5 compares the PEG values and rankings in the 2000–2006 period under alternative definitions of poverty.[8] It is noteworthy that defining poverty more holistically to capture non-income dimensions significantly changes the picture, particularly on a cross-country basis. It is remarkable how Indonesia moves from the top of the list based on income poverty to the opposite end near the bottom once poverty is defined multidimensionally. Aside from Indonesia, other countries whose relative standings change markedly with a multidimensional definition of poverty are Mongolia, Pakistan, and Sri Lanka, and to a lesser extent, the Philippines and PRC. In the case of Mongolia and the Philippines, a more positive picture emerges once poverty is defined multidimensionally, as the perverse positive sign of the PEG disappears with this more holistic poverty definition.

Table 5: PEG Rankings Using Income and HPI, 2000–2006

Country	PEG (Income)	PEG (HPI)	Country
Indonesia	-1.652	-1.464	Malaysia
Pakistan	-1.636	-1.231	Singapore
PRC	-1.306	-1.190	Thailand
Malaysia	-0.806	-1.181	Viet Nam
Thailand	-0.755	-1.021	Nepal
Viet Nam	-0.643	-0.901	Mongolia
Sri Lanka	-0.586	-0.791	PRC
Nepal	-0.515	-0.583	Cambodia
Bangladesh	-0.469	-0.547	Pakistan
Cambodia	-0.158	-0.489	Philippines
India	-0.157	-0.373	Bangladesh
Philippines	**0.154**	-0.322	India
Mongolia	**1.855**	-0.292	Myanmar
Singapore	NA	-0.284	Indonesia
Myanmar	NA	-0.130	Sri Lanka

These results suggest that in these countries, there is weak correlation between income level and human welfare indicators, particularly in education and health which are the two elements additionally accounted for by the HPI. In the case of Indonesia and Pakistan, the evidence suggests that strong improvement in reducing income-based poverty after 2000 has not translated into similarly strong improvement in education and health status of the people, particularly the poor. Similarly, the moderate pace of income poverty reduction that accompanied economic growth in Sri Lanka did not translate into a commensurate improvement in non-income welfare indicators for the poor. On the other hand, the increase in income poverty incidence in Mongolia and the Philippines was mitigated by improvements in non-income based welfare indicators. This outcome suggests that the government may have been relatively successful in delivering education and health services to the income-poor, particularly in Mongolia where the turnaround resulting from the broader definition of poverty is more dramatic.

Comparing country performances across the two decades and considering the redefinition from income-based to multidimensional poverty (Table 6), Thailand and Malaysia emerge as

[8] Note that the interval over which the income poverty-based PEG is derived may not exactly coincide with the 2000-2006 interval used for the HPI-based elasticity estimates due to varying periods of data availability (see 4th column of Table 2).

having exhibited most dramatic progress in translating economic growth to poverty reduction.[9] Both countries moved from the lower half of the list in the 1990s to top positions in the list in the 2000–2006 period. In the case of Thailand, deliberate efforts to prioritize social development starting in the late 1990s, as embodied in its five-year development plans, appear to have paid off well. The same situation in the 1990s had prompted Malaysia to devote a relatively larger portion of public expenditures to education and health in the 2000–2007 period (as seen in the analyses below, and as evident in Table 10 further below). This and other deliberate efforts to strengthen social safety nets in Malaysia have clearly yielded positive results contributing to the above outcome.[10]

Table 6: PEG Rankings in 1990–1996 and 2000–2006

Country	PEG (Income) 1990–1996	PEG (HPI) 2000–2006	Country
Bangladesh	-1.475	-1.464	Malaysia
Republic of Korea	-1.343	-1.231	Singapore
Indonesia	-1.326	-1.190	Thailand
Nepal	-0.946	-1.181	Viet Nam
Philippines	-0.930	-1.021	Nepal
Malaysia	-0.693	-0.901	Mongolia
Thailand	-0.285	-0.791	PRC
India	-0.117	-0.583	Cambodia
Pakistan	0.225	-0.547	Pakistan
PRC	0.312	-0.489	Philippines
		-0.373	Bangladesh
		-0.322	India
		-0.292	Myanmar
		-0.284	Indonesia
		-0.130	Sri Lanka

4. WHAT DRIVES THE LINKAGE?

At least three general factors are widely believed to explain differences in the poverty reduction response to economic growth across countries, namely:

- Sectoral effects (composition of output and of output growth; sectoral growth rates)
- Public investments (e.g., in health and education, housing, agriculture)
- Quality of governance

In the discussions below, the effects of these factors are first examined individually, using graphical (scatterplot) and pairwise simple regression analysis. A multiple regression analysis is further undertaken to examine possible interactions among the explanatory variables in determining the magnitudes of the PEG.

[9] Note that this is probably true of Viet Nam as well; unfortunately, the data was not available to permit calculation of the PEG for Viet Nam in the 1990s.

[10] Unfortunately, complete data (especially on poverty indicators) were not available for both Singapore and Viet Nam in the 1990s, preventing comparisons between the two decades for these countries.

4.1 Sectoral Composition of GDP and GDP Growth

Will an agriculture-dominated economy tend to have more inclusive growth than one dominated by manufacturing, or by services? Will agriculture-driven growth lead to more inclusive growth?

It is commonly believed that an agriculture-led economy and agriculture-led growth promotes faster rural poverty reduction, and because rural poverty tends to dominate overall poverty in most countries, overall poverty is expected to fall faster with an agriculture-driven economic growth. It has been noted, however, that this does not necessarily apply for all countries. Indeed, as mentioned earlier, Hasan and Quibria (2004) cautioned that the experience has varied across regions, and while agriculture had been an important driver of employment creation and poverty reduction in East/Southeast Asia, it was manufacturing that appeared more instrumental in South Asia for generating much employment and driving down poverty.

Table 7 shows that most Asian economies have in fact been dominated by the services sector in the past decade. The PRC is a notable exception, where manufacturing has been the largest sector in the economy. Based on sectoral contribution to economic growth, PRC, Thailand, and to some extent Viet Nam, have also been exceptions in the region, with manufacturing being a prominent driver of economic growth. Agriculture had been a relatively minor contributor, except in the case of Myanmar, where it dominates, as well as Mongolia and Nepal, where the manufacturing sector is relatively miniscule.

Table 7: Sectoral Shares and Growth Contributions in Asian Countries, 2000–2007

Country	Sectoral GDP Shares (%)			Sectoral Contribution to GDP Growth (%)		
	Agri	Mfg	Svcs	Agri	Mfg	Svcs
Bangladesh	22.42	15.67	47.27	11.53	22.07	48.53
Cambodia	30.91	18.94	38.07	16.50	25.46	39.58
India	20.85	15.16	53.10	7.89	15.82	63.85
Indonesia	14.92	27.86	40.45	9.54	26.56	54.48
Malaysia	8.20	30.24	48.07	5.33	28.37	60.79
Mongolia	22.54	5.81	49.66	29.04	2.20	41.18
Myanmar	50.72	9.45	35.34	39.18	16.77	37.67
Nepal	35.79	8.28	44.16	33.22	2.56	48.89
Pakistan	23.31	17.02	51.94	10.25	28.55	58.61
Philippines	19.45	24.16	47.07	14.86	20.20	59.75
PRC	12.52	42.07	41.56	5.00	48.16	43.58
Singapore	0.09	25.60	67.09	0.04	27.09	70.32
Sri Lanka	13.76	18.04	58.22	5.36	15.41	64.97
Thailand	9.69	37.98	44.36	5.27	47.28	39.49
Viet Nam	20.65	21.60	40.59	9.97	32.90	39.00

An examination of the relationship between the poverty elasticity of growth and sectoral shares in GDP based on scatterplots and simple regressions yields no clear systematic relationship in both periods (see Figures 2a-b to 4a-b). Simple regressions yield insignificant coefficients and very little explanatory power (see Table 8).

Figure 2a: PEG vs. Agriculture Sector Share in GDP, Asian Countries (1990–1996)

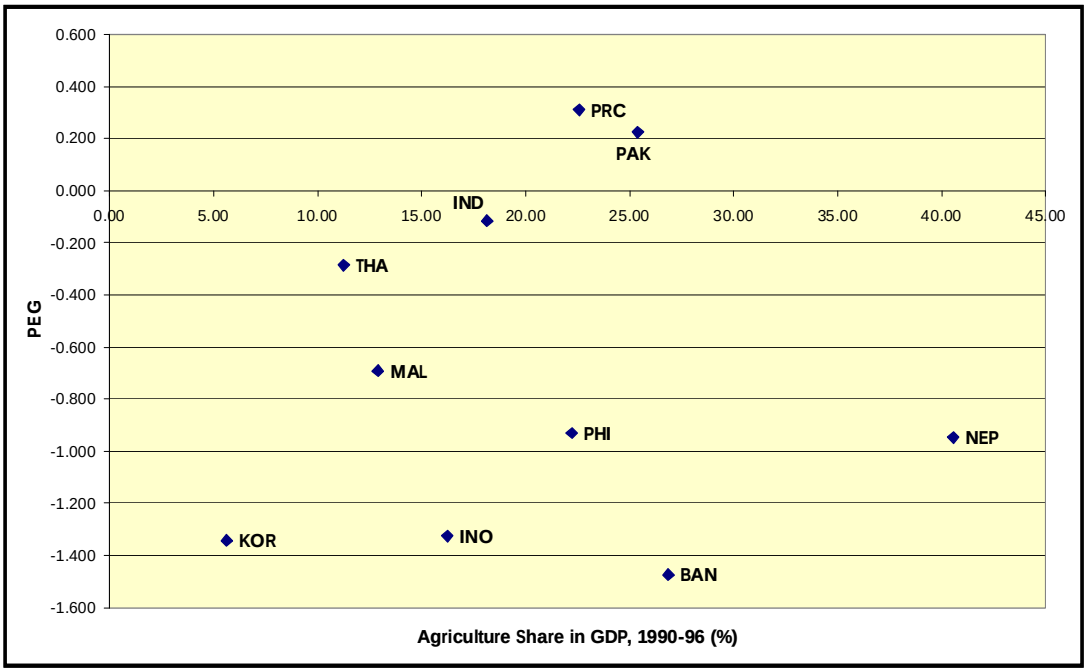


Figure 2b: PEG vs. Agriculture Sector Share in GDP, Asian Countries (2000–2006)

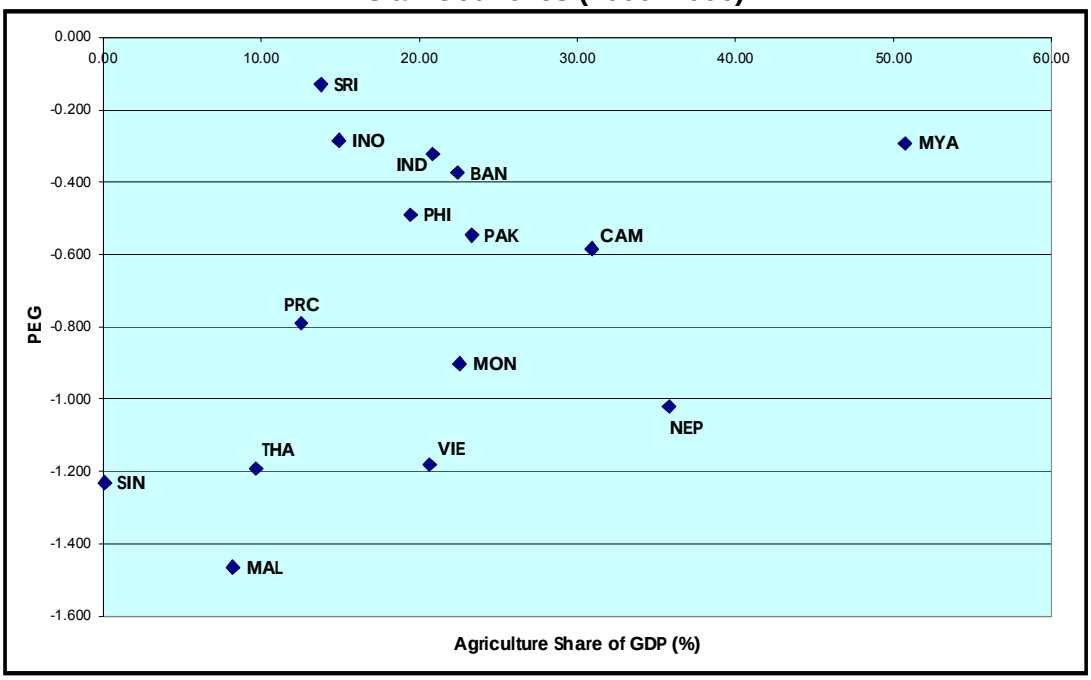


Figure 3a: PEG vs. Manufacturing Share in GDP, Asian Countries (1990–1996)

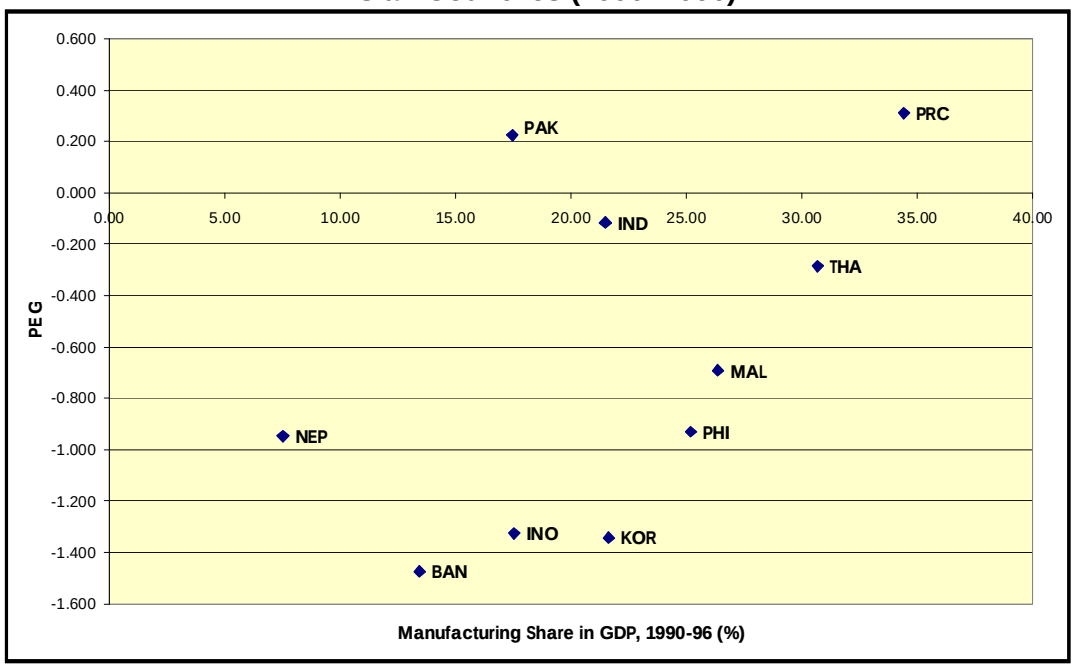


Figure 3b: PEG vs. Manufacturing Share in GDP, Asian Countries (2000–2006)

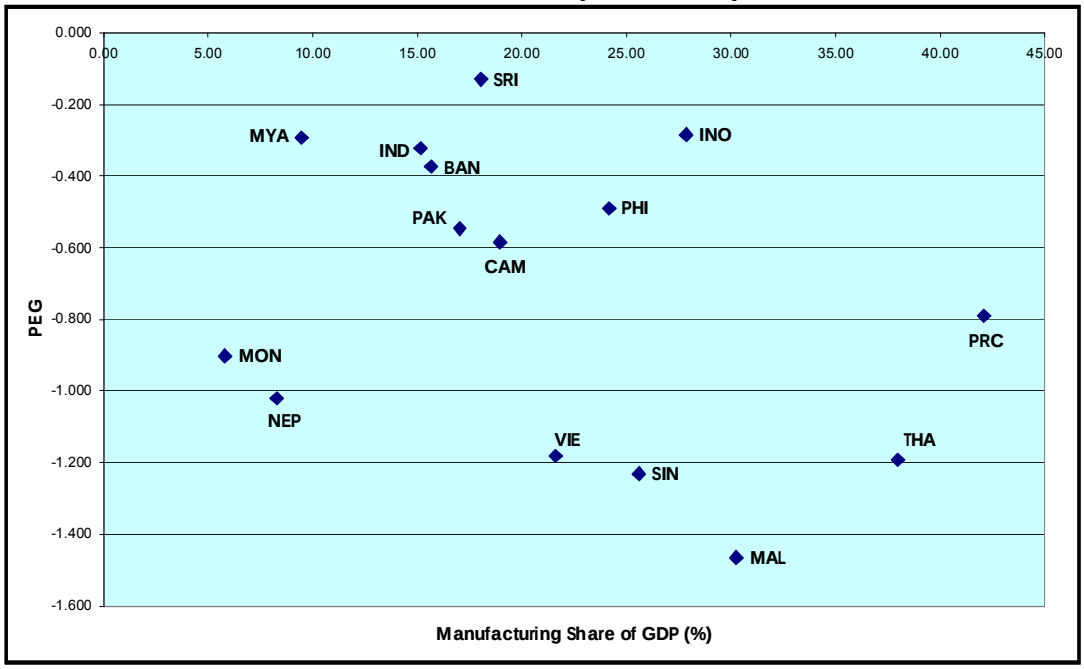


Figure 4a: PEG vs. Services Share in GDP, Asian Countries (1990–1996)

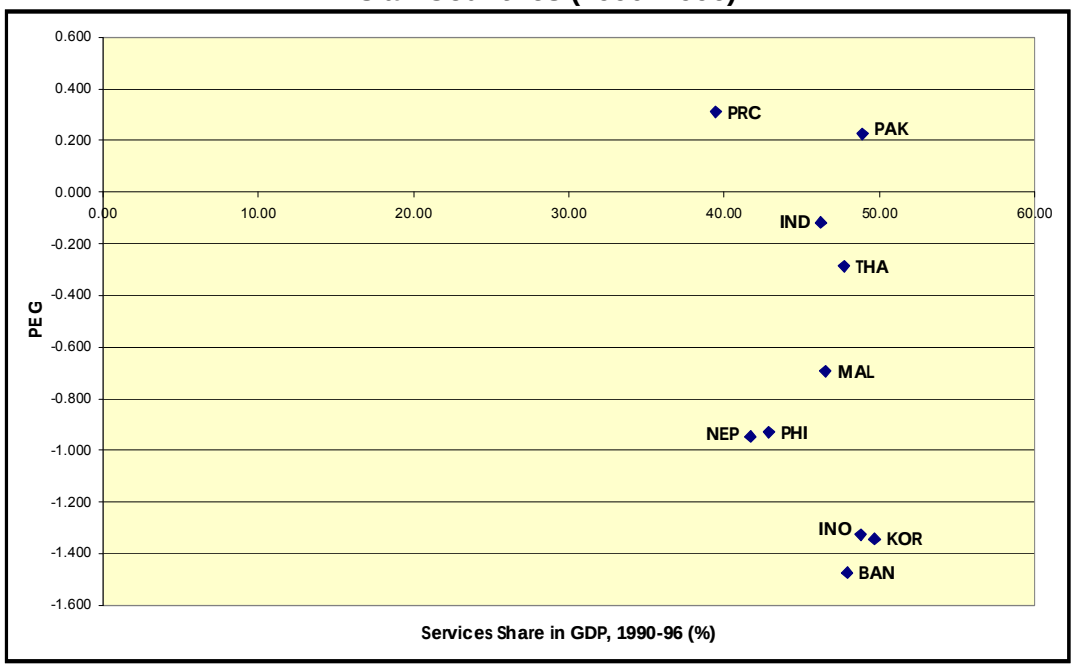


Figure 4b: PEG vs. Services Share in GDP, Asian Countries (2000–2006)

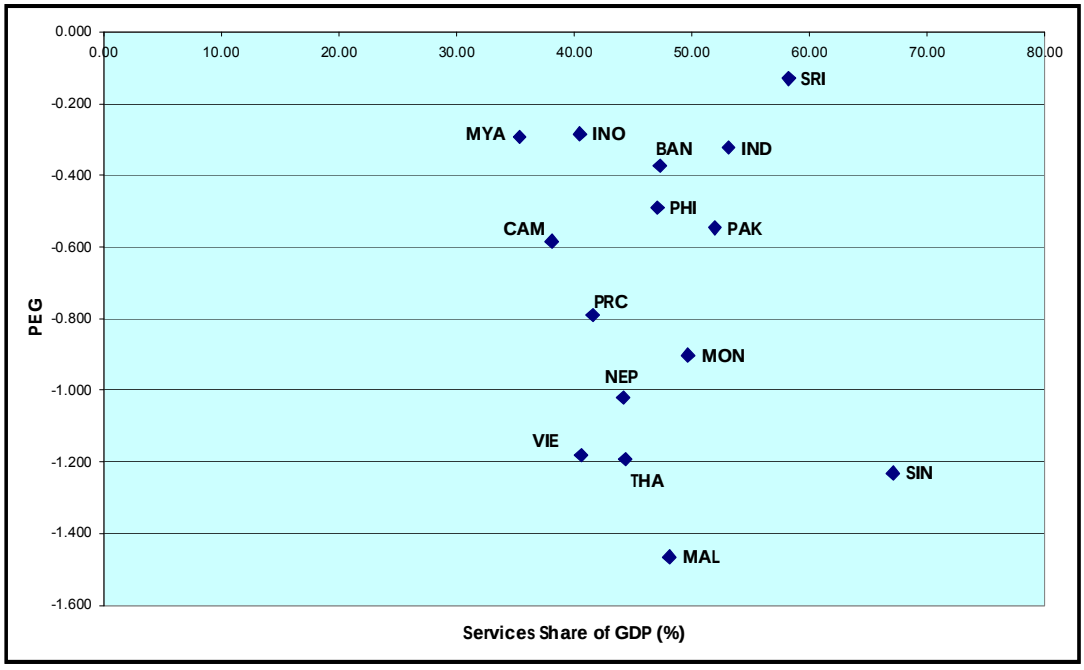


Table 8: Regression Results, PEG vs. Sectoral Shares in GDP

Reg	Estimated Value	Std Error	t-value	R-Squared
Intercept	-1.004	0.206	-4.883	
Agri GDP Share	0.014	0.009	1.596	0.16
Intercept	-0.433	0.248	-1.744	
Mfg GDP Share	-0.014	0.011	-1.281	0.11
Intercept	-0.463	0.676	-0.685	
Svcs GDP Share	-0.005	0.014	-0.386	0.01

Similarly, there is weak evidence of any systematic relationship between sectoral contributions to GDP growth and the PEG in both periods, especially for agriculture and services (see Figures 5a-c to 6a-b). For agriculture's growth contribution, isolating the Southeast Asian countries (Figure 5c) does not yield the expected relationship based on the earlier observations by Hasan and Quibria (2004) (see further below). Indeed, Figure 5c and Table 9 even suggest a puzzling perverse effect whereby a stronger agriculture growth contribution is associated with less inclusive growth (i.e., a positive coefficient). These results run counter to the widely held belief that agriculture-driven growth is crucial to poverty reduction.

A similar result is obtained when services sector contribution to growth is plotted against the PEG (Figure 6a-b); no systematic relationship is readily apparent. On the other hand, some semblance of an influence may be seen in the case of manufacturing's contribution to growth, particularly in 2000–2006 (Figures 7b-c), but not in 1990–1996 (Figure 7a). The relationship appears to be stronger and regression coefficients become significant (Table 9)[11] when the analysis is confined to Southeast Asian countries (Figure 7c).

The above finding provides some indication that the manufacturing sector may have taken a more important role as driver of employment and poverty reduction especially in Southeast Asia in recent years. This is a departure from the earlier experience observed by Hasan and Quibria (2004) for the 1990s, when agriculture was seen to have been more instrumental to inclusive growth in Southeast Asia, while light manufacturing played the same role in the case of South Asia.

[11] Coefficients in **boldface** in Table 9 and subsequent tables of regression results are significant to the 5–10% level.

Figure 5a: PEG vs. Agriculture Sector Contribution to GDP Growth, Asian Countries (1990–1996)

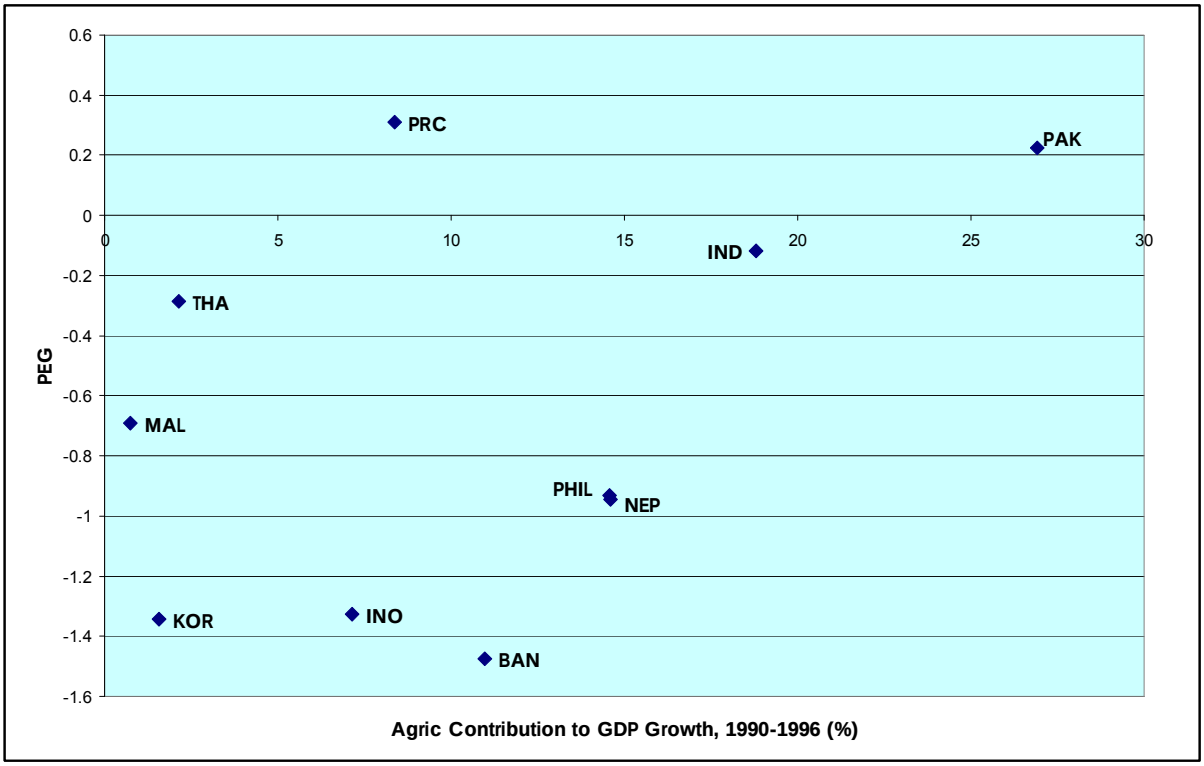


Figure 5b: PEG vs. Agriculture Sector Contribution to GDP Growth, Asian Countries (2000–2006)

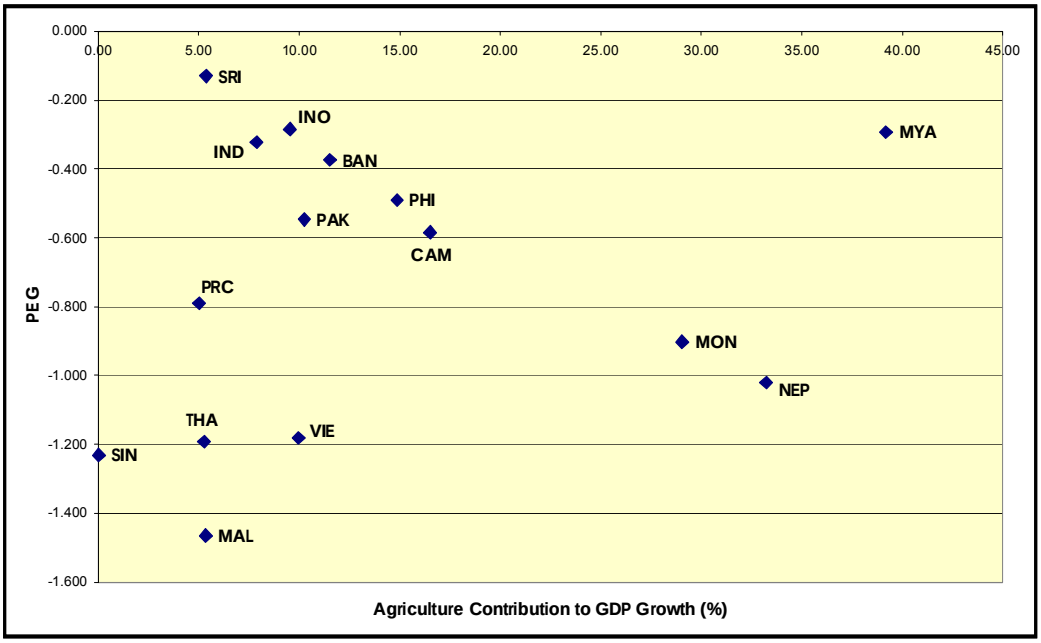


Figure 5c: PEG vs. Agriculture Sector Contribution to GDP Growth, Southeast Asian Countries (2000–2006)

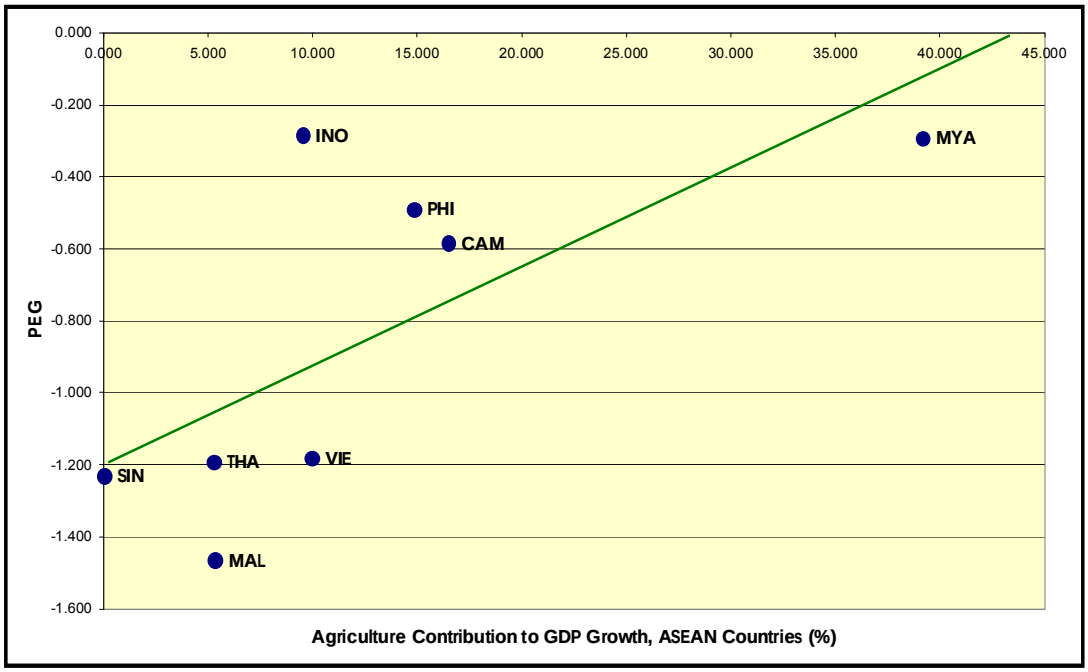


Figure 6a: PEG vs. Services Sector Contribution to GDP Growth, Asian Countries (1990–1996)

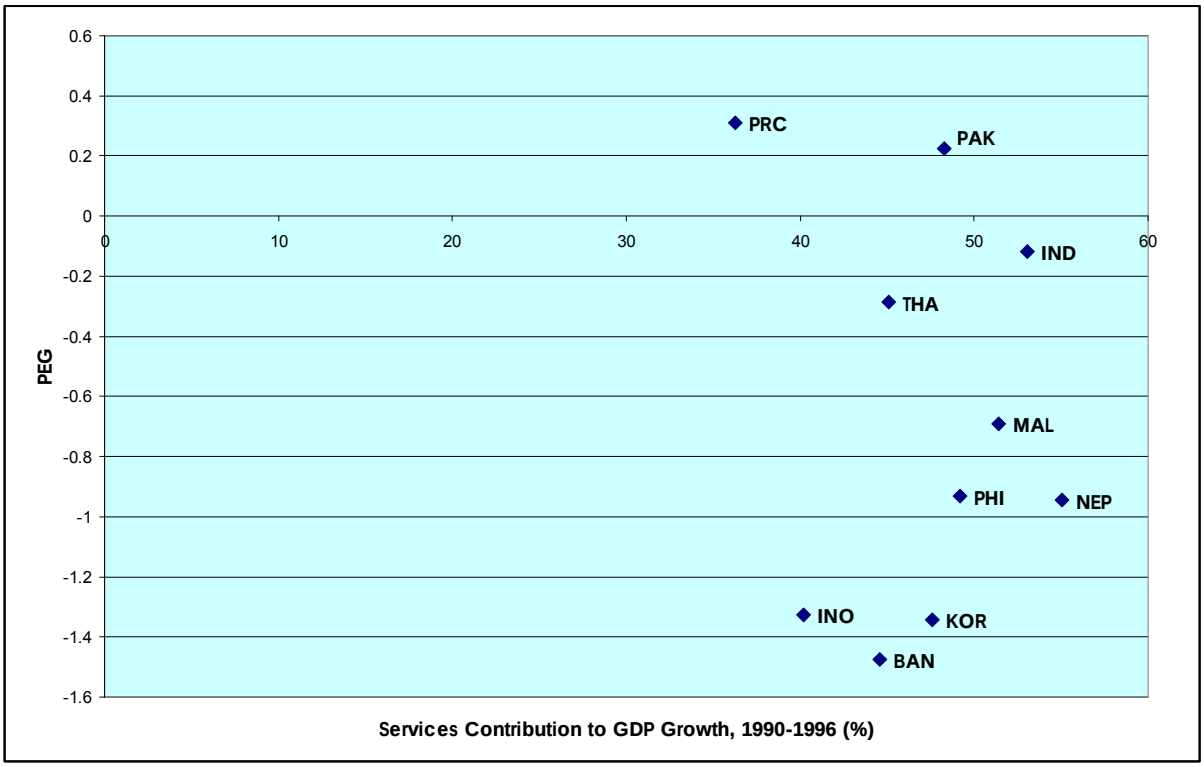


Figure 6b: PEG vs. Services Sector Contribution to GDP Growth, Asian Countries (2000–2006)

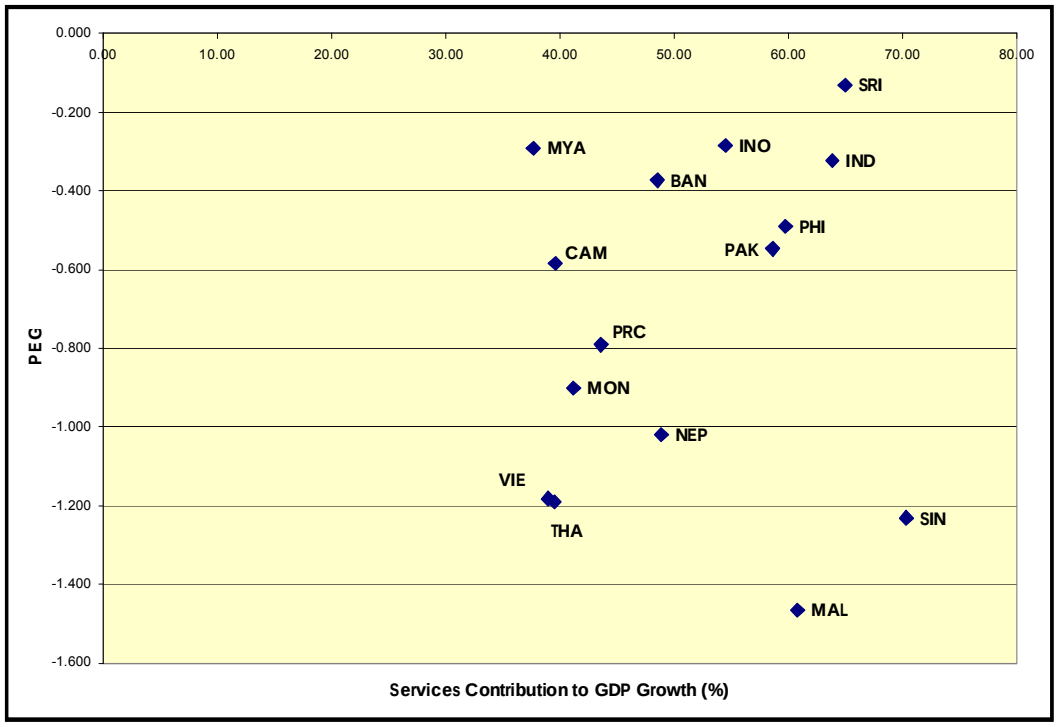


Figure 7a: PEG vs. Manufacturing Contribution to GDP Growth, Asian Countries (1990–1996)

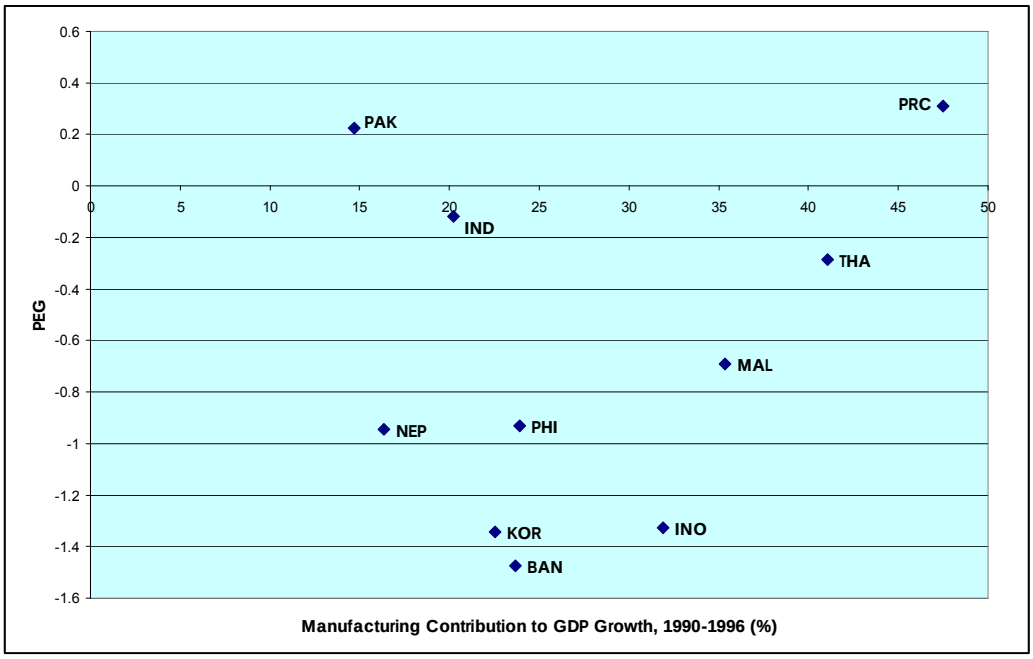


Figure 7b: PEG vs. Manufacturing Sector Contribution to GDP Growth, Asian Countries (2000–2006)

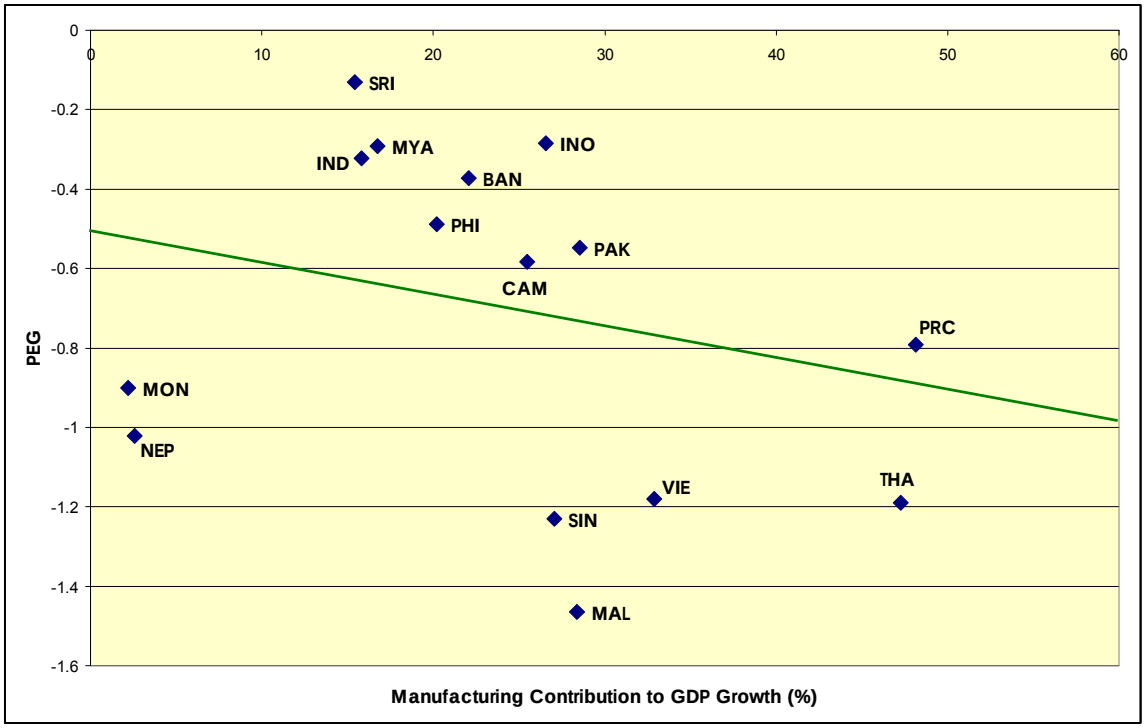


Figure 7c: PEG vs. Manufacturing Sector Contribution to GDP Growth, Southeast Asian Countries (2000–2006)

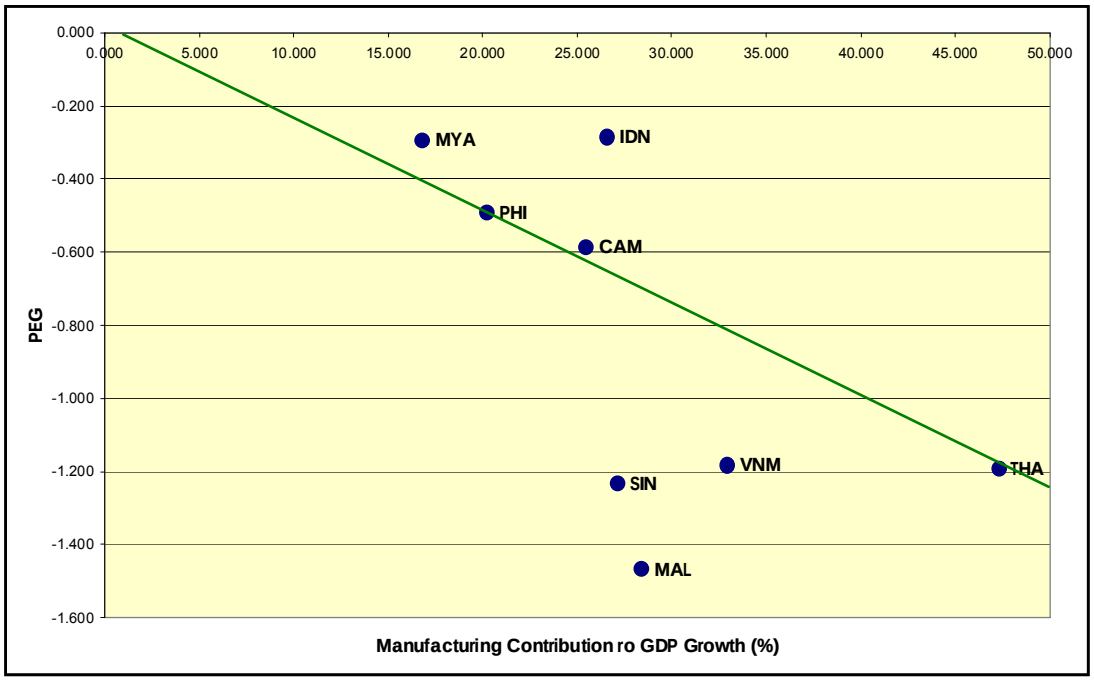


Table 9: Regression Results, PEG vs. Sectoral Contributions to Growth

Reg	Estimated Value	Std Error	t-value	R-Squared
Intercept	-0.809	0.176	-4.608	
Agri Contribution	0.007	0.010	0.653	0.03
Intercept	-0.500	0.231	-2.165	
Mfg Contribution	-0.009	0.009	-1.074	0.08
Intercept	-0.924	0.550	-1.681	
Svcs Contribution	0.004	0.010	0.379	0.01
ASEAN Only				
Intercept	**-1.184**	0.197	-6.004	
Agri Contribution	**0.027**	0.012	2.340	0.48
Intercept	0.045	0.491	0.091	
Mfg Contribution	**-0.031**	0.017	-1.884	0.37
Intercept	-0.365	0.759	-0.481	
Svcs Contribution	-0.009	0.015	-0.643	0.06

ASEAN = Association of Southeast Asian Nations

Finally, using sectoral growth rates directly as explanatory variables fails to yield any significant relationship with the PEG, as indicated by dispersed scatterplots and insignificant regression estimates (Annex Figures 1a–c; Annex Table 2).

4.2 Public Expenditures

Data on public expenditures derived from the annual ADB *Key Indicators of Developing Asian and Pacific Countries* are summarized in Table 10. For our purposes, we examine public expenditures on health, education, housing, and the agricultural sector as candidate variables that would influence the size of the PEG.

The following observations emerge from the table:

- Malaysia and Mongolia have made the largest public investments in education, exceeding 6% of GDP, while on the other extreme is Indonesia, with less than 1% of GDP being spent by government on education.
- Mongolia has made the largest public investments in health, while Indonesia and the Philippines have made the smallest, at less than half a percent of GDP.
- Malaysia has made the largest public investments in education and health combined, at over 7% of GDP, while Indonesia emerges as having made the smallest.

- Singapore has made the largest public investments in housing (at more than 2% of GDP), while the Philippines emerges as having made the smallest, with a miniscule 0.09% of GDP.
- Nepal and Thailand have made the largest public investments in agriculture, while Singapore (not surprisingly) has made a relatively miniscule public investment in the sector.

Table 10: Public Expenditures on Education, Health, Housing, and Agriculture in Asian Countries, 2000–2007 (% of GDP)

Country	Public Expenditures (% of GDP)				
	Educ	Health	E&H	Housing	Agric
Bangladesh	2.047	0.870	2.918	0.354	0.517
Cambodia	1.468	0.903	2.371	--	0.903
India	--	--	--	--	--
Indonesia	0.903	0.269	1.172	1.012	0.508
Malaysia	6.124	1.789	7.913	0.383	0.878
Mongolia	6.854	3.687	--	1.206	0.759
Myanmar	--	--	--	--	--
Nepal	2.740	0.873	3.614	1.482	1.451
Pakistan	--	--	--	--	--
Philippines	2.900	0.323	3.224	0.089	0.896
PRC	3.333	--	--	--	0.936
Singapore	3.624	1.039	4.663	2.089	0.054
Sri Lanka	2.333	1.665	3.998	0.758	0.945
Thailand	4.187	1.416	5.603	0.742	1.280
Viet Nam	--	--	--	--	--

Source: ADB Key Indicators of Developing Asian and Pacific Countries

Scatterplots and simple regression results on pairwise relationships between these categories of expenditures and PEG are presented in Figures 8 to 10 and Table 11.

The data point to a close correlation between public expenditures on health and education and the poverty elasticity of growth (see Figure 8 and Table 11). With R^2 of 0.61 (solid line in Figure 8), the variation in education and health expenditures expressed as a percentage of GDP would appear to account for close to two thirds of the variation in the PEG. This correlation is even stronger if one eliminates outlier Sri Lanka from the analysis; in this case, the R^2 rises to 0.81 (dotted line in Figure 8). These results support the findings of Anand and Ravaillon (1993); Bidani and Ravaillon (1997); Self and Grabowski (2003); and Baldacci, Guin-Siu, and De Mello (2003), among others, which are all contrary to the observations made by Carrin and Politi (1996), Filmer and Pritchett (1999), Landau (1986), and Al-Samarrai (2002), who found weak correlation between public spending and social development outcomes. It must be noted that the present analysis differs from the others cited in that it examines the influence of public expenditures not directly on social outcomes, but on the *responsiveness* of social outcomes to economic growth.

Figure 8: PEG vs. Public Expenditures on Health and Education, 2000–2006

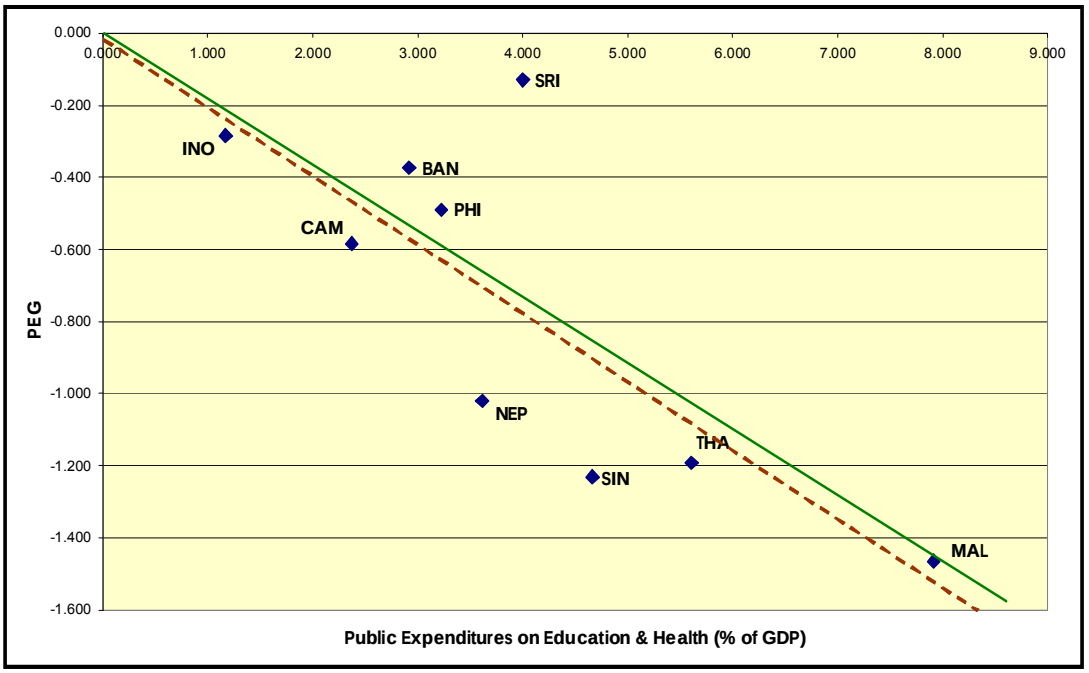
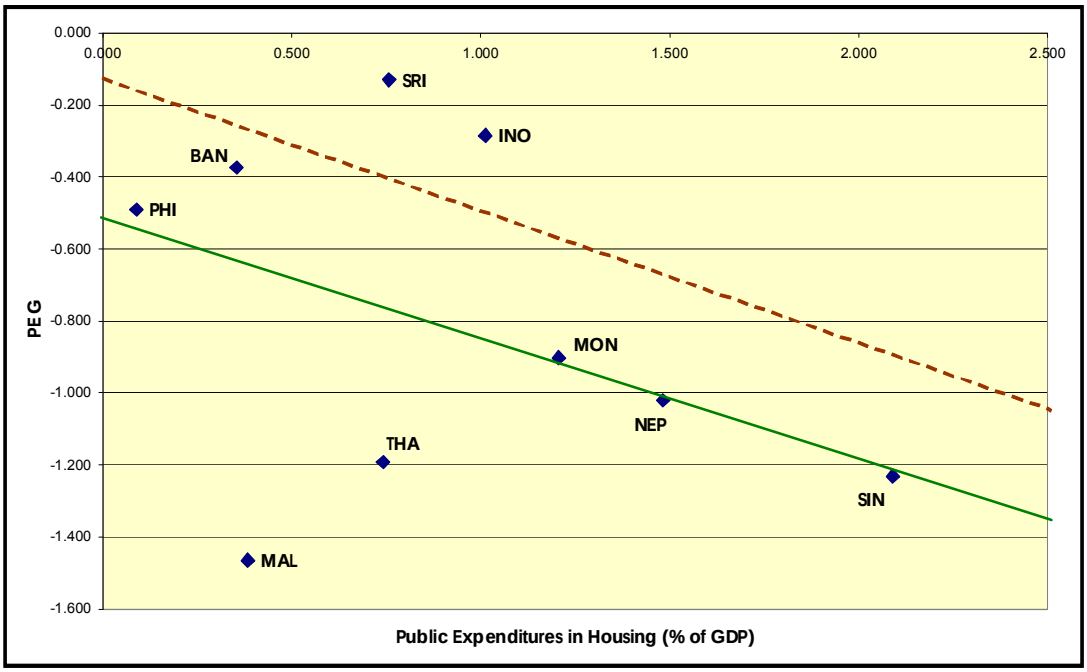


Table 11: Regression Results, PEG vs. Social Expenditures, 2000–2006

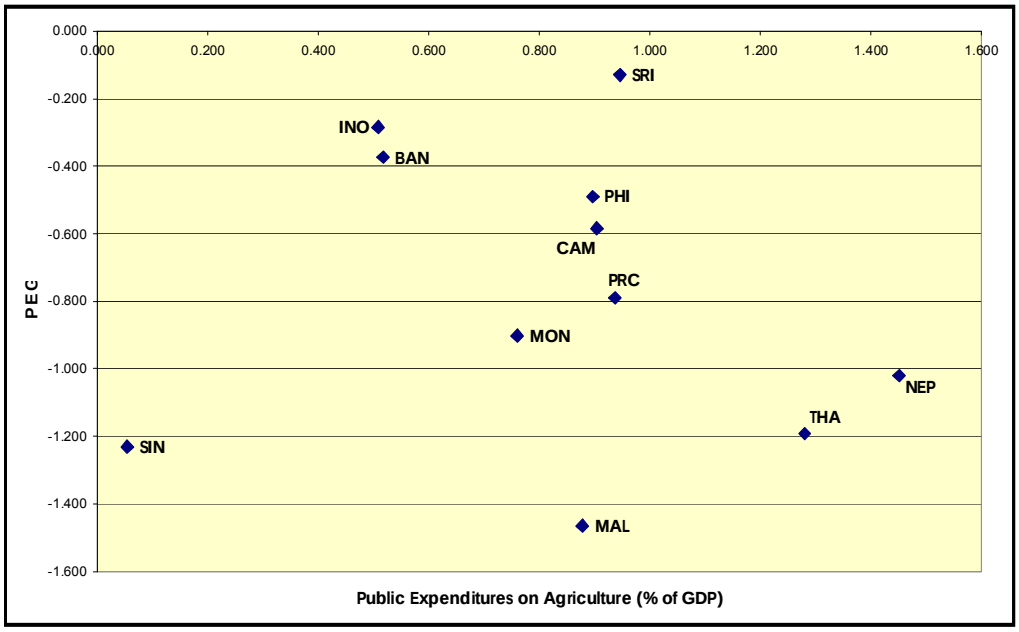
Variable	Estimated Value	Std Error	t-value	R-Squared
Intercept	0.004	0.250	0.017	
Health & Educ Exp	**-0.192**	0.057	-3.337	0.61
Excluding Sri Lanka				
Intercept	-0.070	0.166	-0.421	0.81
Health & Educ Exp	-0.193	0.038	-5.118	
Intercept	-0.559	0.294	-1.902	
Housing Exp	-0.253	0.273	-0.925	0.11
Excluding Malaysia & Thailand				
Intercept	-0.160	0.206	-0.776	
Housing Exp	**-0.473**	0.175	-2.707	0.59

Figure 9: Public Expenditures on Housing vs. PEG



Similarly, public expenditures on agriculture do not appear to have any discernible systematic relationship with the value of the PEG (see Figure 10), yielding insignificant coefficient estimates and a very low R^2 of 0.01. This observation need not be surprising, though, as agriculture expenditures can take a wide variety of forms, and the nature and quality of such expenditures differs widely across countries and across time, thereby negating the appearance of any systematic relationships that aggregate figures alone could reveal. One cannot therefore conclude readily from this that public investments in agriculture are not warranted and must assume lower priority. That is, the above result may simply be a reflection of the wide scope for variation in the nature and quality of expenditures undertaken by governments for agriculture, including likely differences in attribution of various types of expenditures to the sector.

Figure 10: PEG vs. Public Expenditures in Agriculture



4.3 Quality of Governance

The best available measure of quality of governance is the Kaufmann and Kraay (2008) series on World Governance Indicators now published annually by the World Bank, and based on a compilation of results of available regular perception surveys. Inasmuch as the earliest year for which the governance index has been estimated is 1996, the analysis could not be done for the 1990-1996 interval, hence is only done for the 2000–2008 period. For this purpose, the index reported for 2005 was used for the analysis, which was taken to adequately reflect the general state of governance during the time interval analyzed. Table 12 gives the data used for the analysis, while Annex Tables 3a to 3f give the detailed governance index data for 1996 to 2007 for the Asian countries studied.

Table 12: Governance Indicators for Asian Countries, 2005

Country	Component Governance Indices						Overall Index (Average)
	Voice & Accountability	Political Stability	Govt Effect-iveness	Regulatory Quality	Rule of Law	Corruption Control	
Bangladesh	-0.543	-1.170	-0.749	-0.893	0.420	0.786	-0.358
Cambodia	-0.852	-0.567	-0.853	-0.432	-0.428	-0.534	-0.611
India	0.360	-0.945	-0.079	-0.252	-0.850	-0.909	-0.446
Indonesia	-0.291	-1.506	-0.491	-0.483	1.360	1.226	-0.031
Malaysia	-0.381	0.317	0.941	0.512	-0.084	-0.350	0.159
Mongolia	0.225	0.844	-0.396	-0.294	-1.500	-1.501	-0.437
Myanmar	-2.118	-1.146	-1.475	-2.148	-0.559	-0.526	-1.329
Nepal	-0.863	-1.909	-0.680	-0.577	-0.996	-1.573	-1.100
Pakistan	-1.156	-1.735	-0.577	-0.672	-0.848	-0.852	-0.973
Philippines	0.026	-1.101	-0.131	-0.079	-0.549	-0.611	-0.407
PRC	-1.538	-0.252	-0.005	-0.329	1.286	1.537	0.116
Singapore	-0.062	1.175	2.220	1.848	1.688	2.262	1.522
Sri Lanka	-0.229	-1.364	-0.274	0.028	0.057	-0.180	-0.327
Thailand	0.008	-0.351	0.225	0.265	0.119	-0.276	-0.002
Viet Nam	-1.476	0.281	-0.397	-0.576	-0.518	-0.730	-0.569

Source: Kaufmann and Kraay (2008)

To check for systematic relationships between the PEG and governance indicators, the PEG is plotted and regressed against the six component indicators of quality of governance as defined in Kaufmann and Kraay (2008) (see Box).

World Governance Indicators: Components

- **Voice and Accountability** – extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media.
- **Political Stability and Absence of Violence** – likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including politically motivated violence and terrorism.
- **Government Effectiveness** – quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies.
- **Regulatory Quality** – ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development.
- **Rule of Law** – extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence.
- **Control of Corruption** – extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests.

Figures 11 to 17 show the respective scatterplots, while Table 13 summarizes the regression results. The specific governance indicators that emerge as having significant bearing on the poverty elasticity of growth are **political stability/control of violence**, **government effectiveness**, and **rule of law,** although their explanatory power only ranges from 16–26% of the variation in PEG. Overall quality of governance, i.e., the average of the six indicators, also has a significant relationship with the PEG. Among the indicators, political stability/absence of violence has the strongest explanatory power, with 26% of the variation in PEG explained by the model (i.e., R^2 of 0.26).

Figure 11: PEG vs. Voice & Accountability

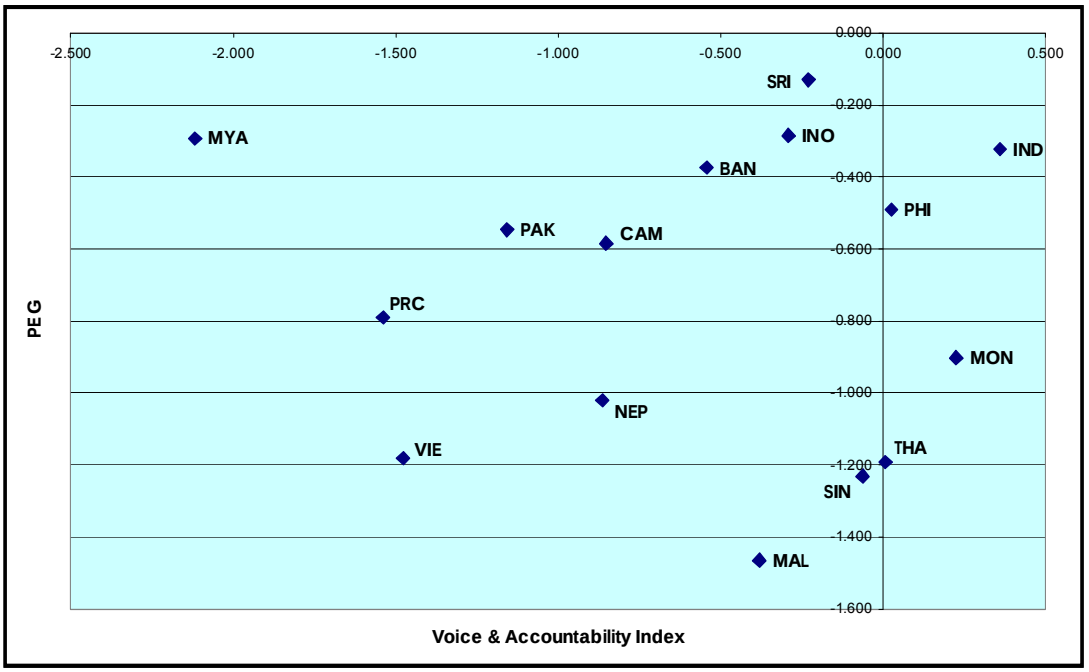


Figure 12: PEG vs. Political Stability

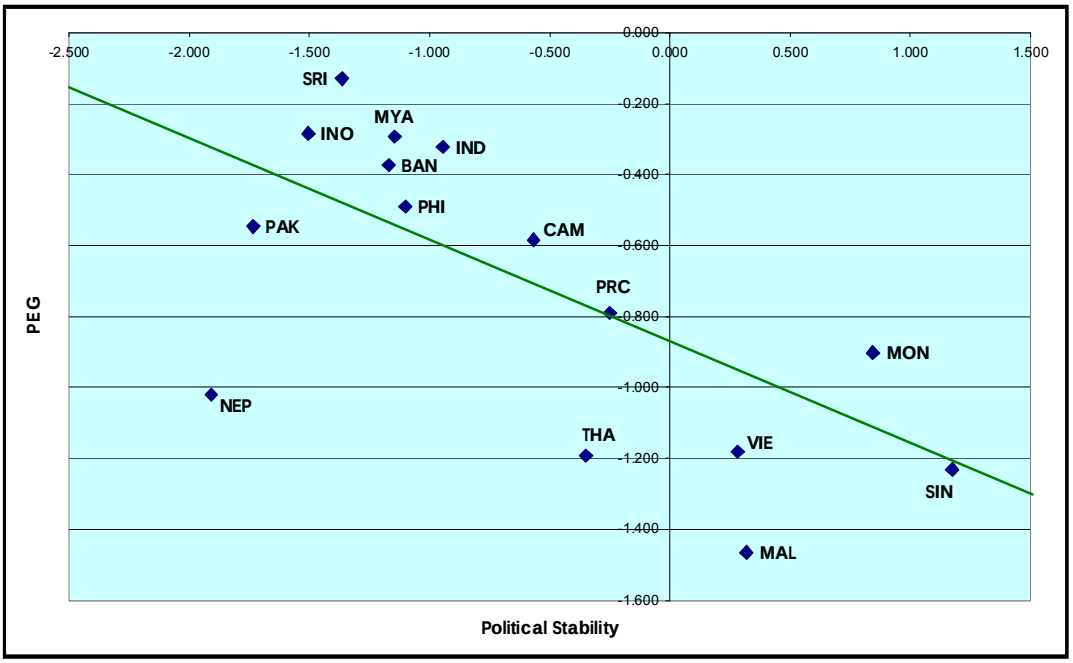


Figure 13: PEG vs. Government Effectiveness

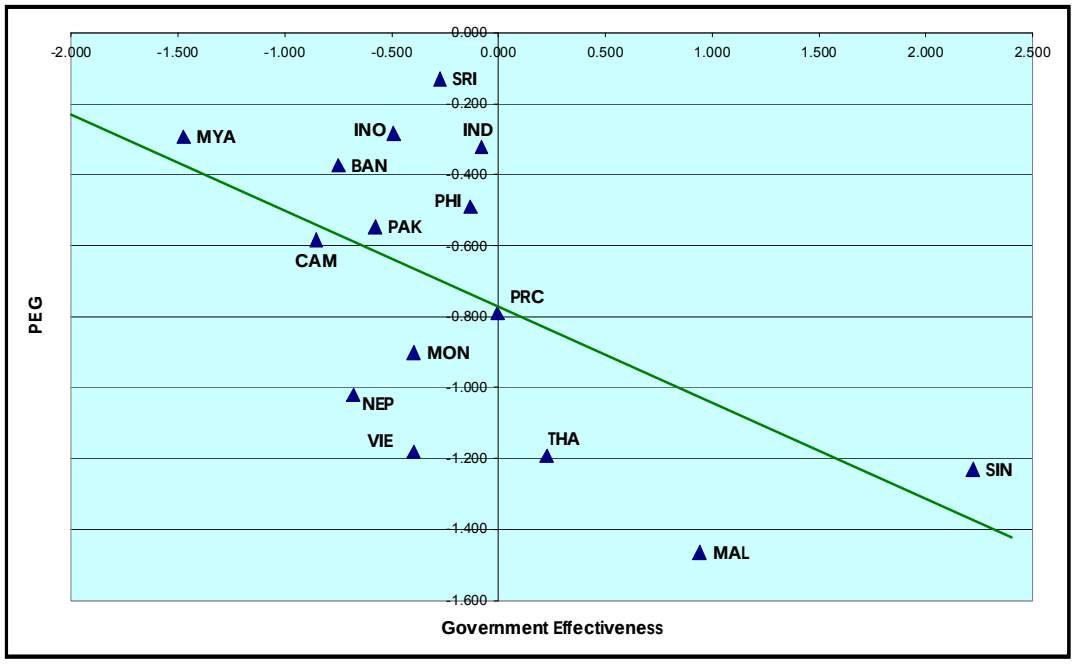


Figure 14: PEG vs. Regulatory Quality

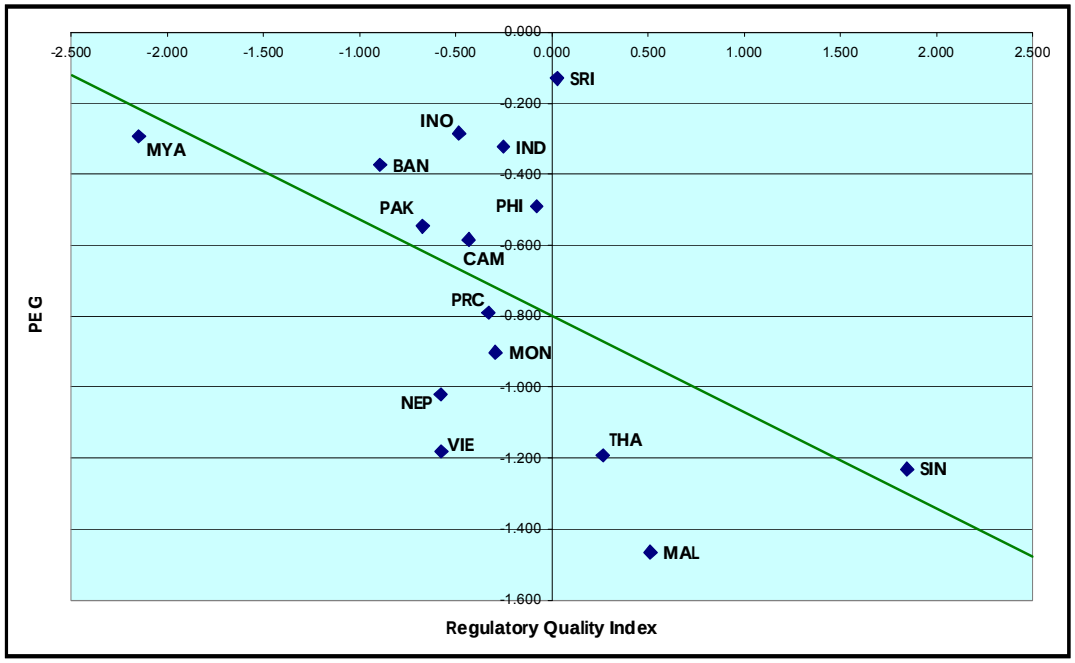


Figure 15: PEG vs. Rule of Law

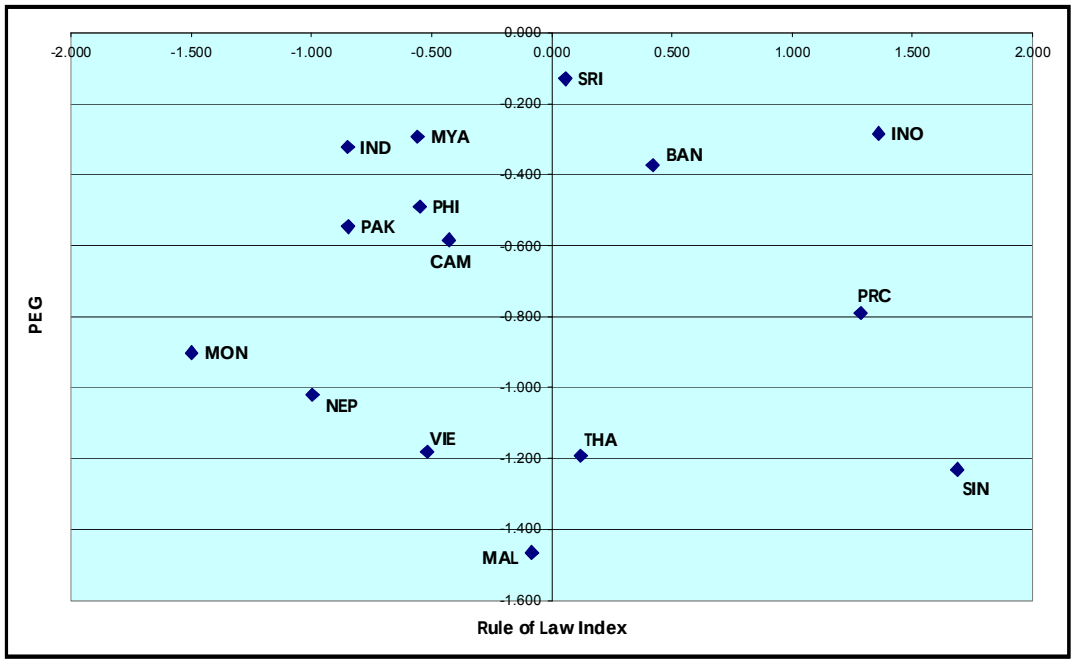


Figure 16: PEG vs. Control of Corruption

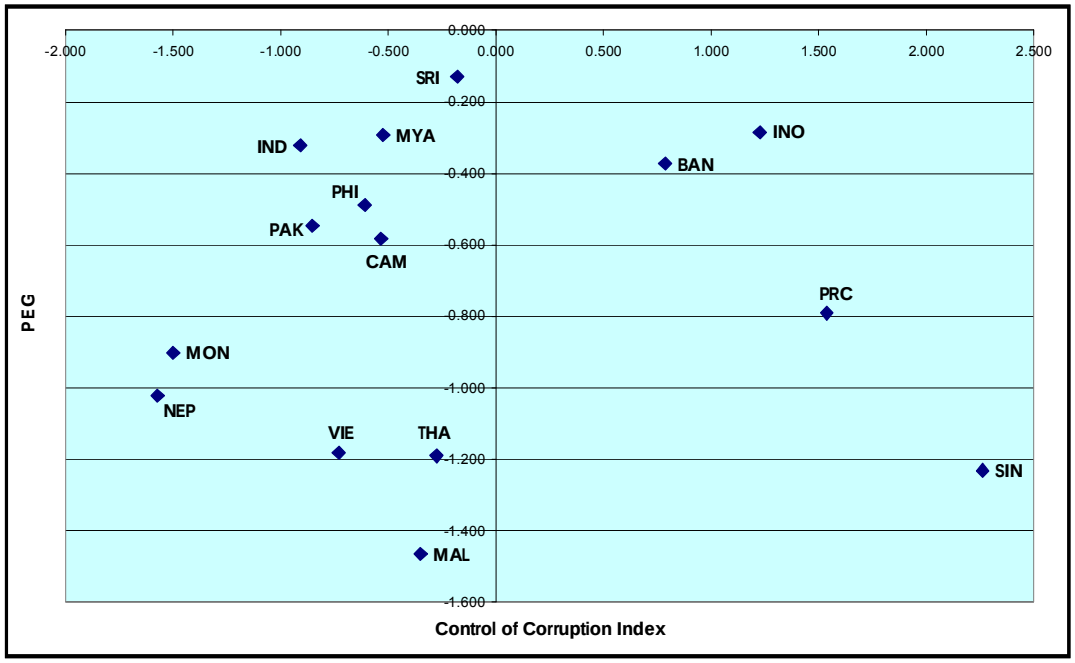


Figure 17: PEG vs. Overall Governance

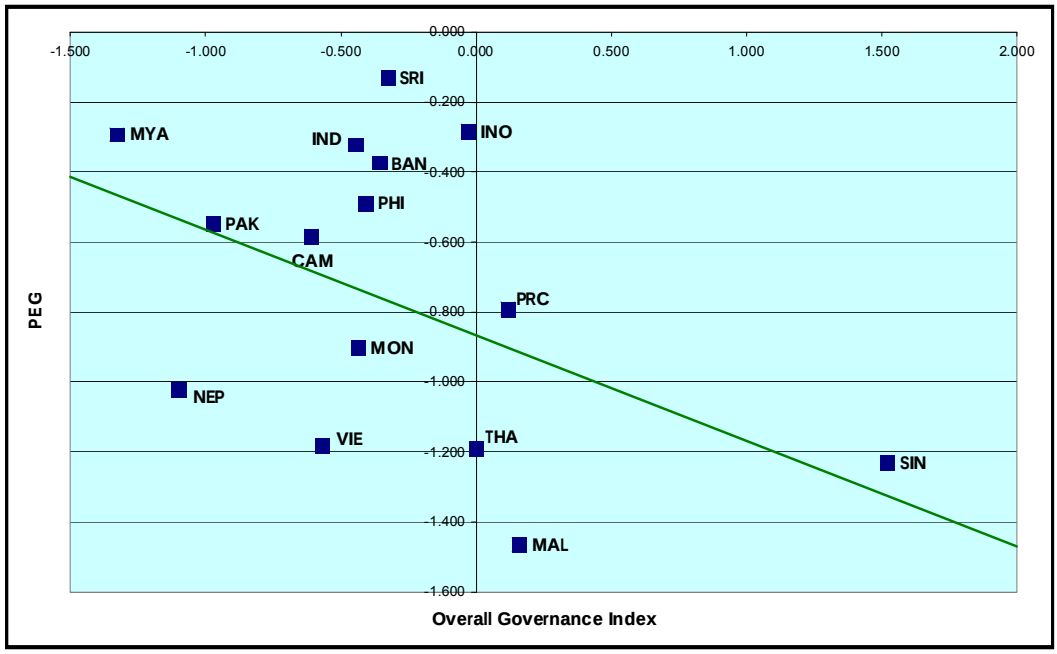


Table 13: Regression Results, PEG vs. Governance Indicators

Variable	Estimated Value	Std Error	t-value	R-Squared
Intercept	-2.836	0.638	-4.446	
Corruption	-0.948	0.651	-1.457	0.14
Intercept	-2.321	0.817	-2.840	
Voice & Accountability	0.202	0.875	0.231	0.00
Intercept	**-3.204**	0.652	-4.916	
Political Stability	**-1.189**	0.556	-2.139	0.26
Intercept	-2.735	0.624	-4.387	
Regulatory Quality	-1.028	0.714	-1.439	0.14
Intercept	**-2.724**	0.589	-4.627	
Rule of Law	**-1.086**	0.688	-1.580	0.16
Intercept	**-2.707**	0.571	-4.738	
Government Effectiveness	**-1.270**	0.639	-1.987	0.23
Intercept	**-2.869**	0.628	-4.570	
Overall Governance	**-1.187**	0.744	-1.595	0.16

4.4 Multiple Regression Analysis

Multiple regression equations were estimated to consider the joint effects of sectoral contributions to growth, public expenditures, and quality of governance. Table 14 gives the best regression results obtained from different combinations of the three variables. Best results were obtained with contribution of agriculture to GDP growth, overall (average) governance index, and public expenditures in education and health as explanatory variables, i.e.,

$$PEG = F(AgrCont, Gov, EH)$$

where AgrCont is the contribution of agriculture to GDP growth, Gov is the overall (average) governance index, and EH is public expenditures in education and health. With an adjusted R^2 of 0.80, the joint effect of agriculture-driven growth, good governance, and social expenditures by the government appear to well explain the variation in PEG across Asian countries. Contrary to the puzzling results obtained under pairwise correlation analysis, agriculture's role this time emerges as a significant determinant of the poverty elasticity of growth, in the expected direction. However, its impact on the PEG is still considerably weaker than those of governance and public expenditures on education and heath, with governance having the strongest effect.

Table 14: Multiple Regression Results

Reg	Estimated Value	Std Error	t-value	R-Squared	Adj R-Squared
Intercept	**0.432**	0.244	1.769	0.87	0.80
Agri Growth Contrib	**-0.041**	0.013	-3.049		
Governance	**-0.520**	0.177	-2.938		
Educ & Health Exp	**-0.201**	0.042	-4.782		
Intercept	**0.542**	0.303	1.791	0.87	0.76
Agri Growth Contrib	**-0.027**	0.015	-1.801		
Governance	**-0.305**	0.214	-1.427		
Educ, Health & Hsng Exp	**-0.210**	0.050	-4.171		
Intercept	-0.047	0.404	-0.117	0.64	0.42
Mfg Growth Contrib	-0.001	0.013	-0.046		
Governance	-0.100	0.209	-0.476		
Educ & Health Exp	**-0.178**	0.071	-2.498		
Intercept	-0.936	0.747	-1.254	0.72	0.56
Services Growth Contrib	0.016	0.013	1.260		
Governance	-0.241	0.199	-1.215		
Educ & Health Exp	**-0.183**	0.061	-2.996		

These results affirm the importance of sectoral contributions to growth (particularly that of agriculture), public expenditures in education and health, and quality of governance in determining the rate of poverty reduction that accompanies economic growth. That is, inclusive growth in Asia has been enhanced when agriculture has a greater contribution to

overall economic growth, when there is better quality of governance, and when more public investments are made in education and health, and housing.

5. KEY OBSERVATIONS AND IMPLICATIONS

5.1 The poverty reduction-GDP growth experience in Asian countries differs markedly between the two decades of the 1990s and the years after the turn of the century.

In the 1990s, Bangladesh, Indonesia, and Korea were the best performers in achieving higher reductions in income poverty (particularly in the rural areas) for every percentage point of economic growth. On the other hand, India, Pakistan, PRC, and Thailand fared most poorly in translating economic growth into rural poverty reduction, with Pakistan and the PRC actually seeing a rise in poverty in the face of the growing economy. These outcomes were in spite of rather high annual rates of GDP growth in the case of the PRC (over 10%) and Thailand (over 8%). In the case of Thailand, this poor translation of rapid economic growth to desired social outcomes had alarmed the Thai government enough to shift its focus toward social development in its subsequent 5-year development plans. The PRC's experience could be the result of the drastic reduction in availability of public social services particularly in health and education that came with the sweeping economic reforms introduced under Premier Deng Xiaoping in the 1980s. Yeh (1996) observed that education expenditures as a proportion of GDP had declined from the mid-1980s (i.e., from a peak of 3.1% in 1986, to only 2% by 1990). School enrollment thus fell steadily through the 1980s, and this decline in accumulation of human capital clearly took a toll by the 1990s.

Malaysia, Nepal, and the Philippines also appear to have made good progress in the 1990s, with each percentage point of GDP growth having been accompanied by an approximately commensurate reduction in the income poverty headcount ratio. The observed outcome for Nepal, based on data reported in the UNDP Human Development Reports, may appear surprising in light of the political turmoil undergone by the country in the 1990s, which had taken a toll on social services and the overall poverty situation. For the Philippines, accelerating economic growth in the early to mid-1990s had been a departure from past years of troubled economic performance, and appears to have translated reasonably well into reduction in income poverty. Top-level commitment to a Social Reform Agenda may have been instrumental to this. In Malaysia, rapid poverty reduction and social development through the 1970s to the 1990s is widely attributed to the affirmative measures undertaken to improve the position of the *Bumiputera* and other disadvantaged groups (Shari 2003).

In examining the 2000–2008 period, it has been possible to employ the multidimensional HPI-1 in the analysis of the poverty reduction-economic growth linkage for Asian countries. The countries that emerge to have been most successful in bringing down multidimensional poverty with economic growth (with magnitude of PEGs exceeding 1) are Malaysia, Nepal, Singapore, Thailand (whose reinforced efforts to emphasize social development appear to have paid off well), and Viet Nam. Cambodia, Mongolia, Pakistan, and PRC likewise appear to have been able to bring down poverty with their economic growth in recent years, with elasticities exceeding 0.5. Bangladesh, India, Indonesia, Myanmar, Philippines, and Sri Lanka have been relatively slower in reducing poverty with economic growth. The Philippines and Sri Lanka actually had rising poverty measured both as income poverty and by the HPI-1 up to 2005, with positive elasticities indicating perverse movement in poverty associated with economic growth. Mongolia likewise had rising income poverty in the same period, but was

mitigated by improvement in non-income welfare indicators, leading to a positive PEG for income poverty, but a normal negative sign when PEG is based on HPI-1. In the case of the Philippines, the rise in poverty accompanied the highest rates of GDP growth recorded in 30 years.

Between the 1990s and the current decade, Pakistan and the PRC achieved a dramatic turnaround in translating economic growth to income poverty reduction, whereas the linkage had been in the perverse direction in the 1990s. In contrast, Bangladesh, Nepal, and the Philippines saw significant deterioration in their ability to translate economic growth into income poverty reduction. Malaysia and Thailand have emerged to be top performers in translating growth into reduction of multidimensional poverty, coming from relatively lower levels of performance in the 1990s in spite of rapid rates of economic growth then. The opposite was the case with Indonesia, which dropped from near the top to near the bottom of the list.

The Indonesian outcome is particularly noteworthy, as it graphically illustrates the difference it can make when poverty is defined multidimensionally as against the usual income-based definition. While Indonesia's PEG in the 2000–2006 period is highly elastic when based on the US$1.25-a-day poverty measure, it has a rather low elasticity based on the HPI-1. This implies that Indonesia has had difficulty improving non-income aspects of welfare among the poor, even as it had been successful in bringing down the numbers of those who earn less than the poverty threshold income. This outcome can in turn be readily attributed to the fact that its public expenditures on social services, particularly health and education, have been the lowest among the Asian countries studied. This appears to be the direct result of the huge fiscal costs of the bank bailouts undertaken by the Indonesian government in the aftermath of the Asian financial crisis. The Philippines in the early 2000s faced a similar fiscal constraint, in this case due to a heavy debt service burden that took about one-third of the government budget, thereby crowding out social expenditures.

A similar result is seen with Pakistan, PRC, and Sri Lanka, all of which have much lower PEGs when poverty is measured multidimensionally. On the other hand, Mongolia's perverse (positive) PEG based on income poverty transforms into a relatively high PEG based on multidimensional poverty, showing that it has been able to compensate for lack of income poverty reduction with improvements in social welfare.

5.2 Sectoral composition of economic growth influences the inclusiveness of growth.

Sectoral structure of the economy and sectoral composition of economic growth have been commonly believed to be important to the attainment of inclusive growth, with a common premise that stronger growth in the agricultural sector would promote faster poverty reduction. This result comes out clearly from the multiple regressions examining the joint effects of agriculture's contribution to GDP growth, quality of governance, and public expenditures in social services on the inclusiveness of growth. The result supports the observation made earlier by Hasan and Quibria (2004) for Southeast Asian economies.

There is also evidence from the data that higher contribution of manufacturing to overall economic growth has been associated with faster poverty reduction in response to economic growth, an effect that is particularly more pronounced in the Southeast Asian countries. This signals a possible impending shift in the relative importance of agriculture and manufacturing as a basis for more inclusive growth, with the latter becoming increasingly important especially in the Southeast Asian countries. The PRC's substantial jump upwards from the

bottom of the list in the 1990s could be a reflection of the rapid growth of its manufacturing sector since then.

5.3 Public expenditures in human development and the social sectors, particularly in health, education, and housing, clearly contribute to the inclusiveness of growth.

There is a clear correlation between the level of social expenditures by the government and the inclusiveness of economic growth attained in Asian countries. The obvious policy implication is that the pursuit of economic growth would be enhanced (i.e., promote more inclusive growth) by deliberate allocation of greater public expenditures to health, education, and mass housing. Contrary to expectations, especially in light of the above results, expenditures on agriculture did not appear to have significant influence on the poverty elasticity of growth. However, this need not lead one to the conclusion that public investments in agriculture are not warranted and must assume lower priority. It is likely that the above result can simply be a reflection of the wide scope for variation in the nature and quality of expenditures undertaken by governments for agriculture, including likely differences in attribution of various types of expenditures to the sector.

5.4 Quality of governance has the strongest impact on inclusiveness of growth.

Among the three determinants of inclusive growth examined in this study, quality of governance emerges as having the strongest effect on the PEG, i.e., on the inclusiveness of growth. In particular, analysis of the data based on the World Bank's World Governance Indicators points to government effectiveness, rule of law, and political stability as having a clear influence. This result is not surprising, inasmuch as governance ultimately determines the effectiveness of the delivery of all interventions coming from government in pursuit of poverty reduction, including public expenditures and policies that would promote broad-based growth in the economy. Thus, the countries that emerge as having had the most inclusive growth in the current decade are also those that are particularly known to have better governance in the region, especially Singapore and Malaysia.

The implication is that investments in strengthening governance, especially in the three areas named above, would be important accompanying measures to initiatives for promoting economic growth. Indeed, apart from enhancing its inclusiveness, economic growth itself would be directly served by improvement in the quality of governance.

6. SUMMARY AND CONCLUSIONS

This study set out to examine the reasons why patterns of poverty reduction accompanying economic growth have varied so widely across Asia. At the same time, it sought to enrich the growth-poverty analysis by employing a more holistic measure of poverty for the analysis, recognizing the limitations of the simple income-based measure of poverty. Cross-section data across 15 Asian countries point to the significant effect of governance, public expenditures in social services, and sectoral composition of GDP growth on the inclusiveness of economic growth, in that order of strength of effect.

The policy directions implied by these results include the following:

- **Initiatives and investments toward strengthening the quality of governance** could be the most important measures a country can take toward attaining inclusive growth, as governance is a critical underlay to all initiatives of government to reduce poverty and promote broad-based growth and development. The recent trend for conscious consideration of governance by the international development institutions both as a prerequisite and as an object in defining the shape of development assistance is thus well placed. As already stated, improvement in the quality of governance would not only enhance the inclusiveness of economic growth, but also directly promote economic growth itself.
- **Public investments in education, health, and housing are important—and indeed most tightly correlated—to the attainment of inclusive growth.** Economic growth by itself, especially when driven by economic sectors with low employment potential, will not guarantee poverty reduction, as borne out by the experience of Pakistan and the PRC in the 1990s and Mongolia, the Philippines, and Sri Lanka in the past decade. In the face of the current global economic downturn, when fiscal stimulus has been a common prescription for reinvigorating the economy, such stimulus spending would be best directed toward improving the heath, education, and housing status of poor citizens. However, it is equally important to ensure that stimulus spending is not undertaken at the expense of fiscal sustainability, as experience has shown (e.g., in Indonesia and the Philippines) that a heavy debt burden will crowd out such crucial public investments in the future.
- **Enhancing the role of agriculture in the growth of the economy continues to have a positive impact on the inclusiveness of growth,** particularly in reducing rural poverty. The obvious key to the role of agriculture is the employment it generates in the rural areas. But this suggests that promotion of rural enterprises in general, including in manufacturing and services, would be instrumental in the attainment of more inclusive, broad-based growth. New emerging rural-based enterprises that promise to provide such opportunities include ecotourism and agri-based manufacturing. Small and medium enterprise (SME) promotion and development would thus be a complementary thrust that would help achieve such expansion of rural enterprise and employment. Governments would do well to address the traditional obstacles faced by SMEs, i.e., access to finance, technology, raw materials, and markets.

The study also points to the need for governments and international development institutions to go beyond income as the primary yardstick for poverty. Results of the analysis showed how dramatic differences in characterization of countries can result when a multidimensional poverty measure is employed rather than a unidimensional one based only on income or expenditure. Thus, as governments or development institutions use poverty as a resource allocation tool, they would do well to find and employ an appropriate poverty indicator that adequately reflects its multidimensional nature.

Future research could enrich this analysis further by maximizing the use of the wide array of data increasingly becoming available to development researchers. The simple analysis undertaken in this study can be extended in two directions: (i) toward construction of a panel data set for Asian countries, to permit a richer cross-country analysis that includes multiple observations over time within individual countries, and (ii) toward development of an even more comprehensive measure of multidimensional poverty applicable to Asian countries, to go beyond the dimensions addressed by the UN Human Poverty Index, which remains confined to income, health, and education status (to additionally address political

empowerment, cultural, and security dimensions, for example). There remains wide scope for promoting inclusive growth or growth that reduces poverty, and this hinges ultimately on researchers being able to use all information to understand poverty and its dynamics better.

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ANNEX

Annex Table 1:
Sectoral Growth Contributions, 1990–1996 and 2000–2007

Country	GDP Growth Contribution, 1990–96			GDP Growth Contribution, 2000–07		
	Agric	Mfg	Services	Agric	Mfg	Services
Bangladesh	10.98	23.66	44.56	11.53	22.07	48.53
Cambodia	42.60	9.51	37.41	16.50	25.46	39.58
India	18.80	20.24	53.06	7.89	15.82	63.85
Indonesia	7.16	31.92	40.21	9.54	26.56	54.48
Malaysia	0.75	35.34	51.39	5.33	28.37	60.79
Mongolia	8.47	16.78	62.02	29.04	2.20	41.18
Myanmar	36.28	9.22	40.09	39.18	16.77	37.67
Nepal	14.61	16.34	55.02	33.22	2.56	48.89
Pakistan	26.91	14.71	48.27	10.25	28.55	58.61
Philippines	14.57	23.89	49.16	14.86	20.20	59.75
PRC	8.38	47.49	36.27	5.00	48.16	43.58
Singapore	-0.10	23.25	66.32	0.04	27.09	70.32
Sri Lanka	6.03	30.17	50.60	5.36	15.41	64.97
Thailand	2.16	41.07	45.07	5.27	47.28	39.49
Viet Nam	14.14	19.33	44.58	9.97	32.90	39.00

Note: Excludes contributions of Mining, Construction, and Utilities

Annex Table 2:
Regression Results, Sectoral Growth Rates vs. PEG, 2000–2007

Reg	Estimated Value	Std Error	t-value	R-Squared
Intercept	-0.810	0.193	-4.189	
Agri Growth Rate	0.027	0.048	0.571	0.02
Intercept	-0.137	0.478	-0.287	
Agri Growth Rate w/o MM*	-0.186	0.143	-1.298	0.13
Intercept	-0.867	0.201	-4.301	
Mfg Growth Rate	0.017	0.020	0.867	0.05
Intercept	-1.108	0.317	-3.497	
Svcs Growth Rate	0.053	0.041	1.300	0.11

Note: *Excluding outliers Myanmar and Mongolia

Annex Table 3a:
Governance Index for Asian Countries, 1996–2007: Control of Corruption

Country	Year								
	2007	2006	2005	2004	2003	2002	2000	1998	1996
Afghanistan	-1.53	-1.46	-1.47	-1.49	-1.62	-1.54	-1.91	0.37	..
Bangladesh	-1.05	-1.26	-1.23	-1.32	-1.17	-1.02	-0.94	0.20	-0.49
Bhutan	0.92	0.89	0.87	0.81	0.89	0.55	0.56	0.31	..
Cambodia	-1.08	-1.17	-1.13	-1.02	-0.90	-0.96	-0.91	0.22	-1.11
Democratic People's Republic of Korea	-1.69	-1.51	-1.30	-1.48	-1.98	-1.13	-1.93	0.35	-0.33
Hong Kong, China	1.61	1.77	1.68	1.58	1.47	1.45	1.19	0.16	1.52
India	-0.39	-0.25	-0.31	-0.34	-0.34	-0.41	-0.38	0.15	-0.36
Indonesia	-0.72	-0.78	-0.88	-0.92	-0.97	-1.12	-0.97	0.15	-0.55
Japan	1.20	1.35	1.25	1.19	1.19	1.05	1.35	0.16	1.14
Lao PDR	-1.00	-1.07	-1.11	-1.05	-0.98	-0.92	-0.90	0.25	-1.00
Malaysia	0.19	0.30	0.26	0.37	0.26	0.33	0.36	0.15	0.49
Mongolia	-0.61	-0.49	-0.52	-0.39	-0.19	0.06	-0.31	0.30	0.37
Myanmar	-1.46	-1.71	-1.59	-1.67	-1.36	-1.35	-1.37	0.24	-1.21
Nepal	-0.66	-0.67	-0.75	-0.61	-0.23	-0.33	-0.43	0.25	-0.31
Pakistan	-0.83	-0.78	-0.99	-1.03	-0.74	-0.83	-0.76	0.20	-1.04
Philippines	-0.79	-0.78	-0.61	-0.60	-0.48	-0.49	-0.53	0.15	-0.27
PRC	-0.66	-0.58	-0.70	-0.61	-0.43	-0.48	-0.28	0.15	-0.15
Singapore	2.20	2.20	2.19	2.33	2.33	2.39	2.20	0.16	2.24
Republic of Korea	0.36	0.29	0.50	0.29	0.29	0.37	0.19	0.15	0.32
Sri Lanka	-0.13	-0.13	-0.26	-0.14	-0.21	-0.21	-0.18	0.20	-0.27
Thailand	-0.44	-0.28	-0.19	-0.21	-0.28	-0.32	-0.20	0.15	-0.31
Viet Nam	-0.69	-0.75	-0.77	-0.79	-0.63	-0.71	-0.77	0.16	-0.54

Source: Kaufmann and Kraay (2008).

Annex Table 3b:
Governance Index for Asian Countries, 1996–2007: Voice and Accountability

Country	Year								
	2007	2006	2005	2004	2003	2002	2000	1998	1996
Afghanistan	-1.17	-1.24	-1.20	-1.22	-1.45	-1.43	-2.00	0.29	-1.82
Bangladesh	-0.63	-0.50	-0.52	-0.66	-0.60	-0.45	-0.44	0.23	-0.23
Bhutan	-0.88	-0.74	-1.01	-0.95	-1.22	-1.22	-0.98	0.29	-1.39
Cambodia	-0.87	-0.87	-1.00	-0.87	-0.83	-0.73	-0.79	0.25	-0.96
Democratic People's Republic of Korea	-2.31	-2.30	-2.16	-2.07	-2.15	-2.13	-2.09	0.26	-2.03
Hong Kong, China	0.59	0.66	0.60	0.54	0.31	0.11	0.00	0.28	0.21
India	0.38	0.41	0.40	0.39	0.31	0.38	0.26	0.23	0.12
Indonesia	-0.17	-0.20	-0.16	-0.31	-0.39	-0.41	-0.40	0.23	-1.17
Japan	0.93	0.90	0.98	0.99	1.01	0.99	0.87	0.23	0.87
Lao PDR	-1.66	-1.64	-1.67	-1.55	-1.73	-1.75	-1.23	0.29	-1.08
Malaysia	-0.55	-0.54	-0.17	-0.25	-0.41	-0.44	-0.29	0.23	-0.31
Mongolia	0.13	0.15	0.04	0.22	0.33	0.33	0.37	0.26	0.46
Myanmar	-2.16	-2.20	-2.18	-2.14	-2.06	-2.01	-2.07	0.23	-2.10
Nepal	-0.89	-1.12	-1.17	-1.02	-0.81	-0.81	-0.22	0.29	-0.06
Pakistan	-1.05	-1.02	-1.05	-1.20	-1.23	-1.19	-1.36	0.23	-0.71
Philippines	-0.17	-0.11	0.04	0.03	0.06	0.14	0.18	0.23	0.17
PRC	-1.70	-1.70	-1.52	-1.46	-1.53	-1.58	-1.29	0.23	-1.66
Singapore	-0.43	-0.37	0.04	0.02	-0.01	0.07	0.25	0.23	-0.21
Republic of Korea	0.66	0.61	0.75	0.71	0.75	0.74	0.61	0.23	0.50
Sri Lanka	-0.39	-0.27	-0.21	-0.16	-0.14	-0.14	-0.29	0.23	-0.24
Thailand	-0.61	-0.60	0.03	0.12	0.26	0.34	0.51	0.23	0.29
Viet Nam	-1.61	-1.58	-1.43	-1.39	-1.55	-1.50	-1.27	0.23	-1.50

Source: Kaufmann and Kraay (2008).

Annex Table 3c:
Governance Index for Asian Countries, 1996–2007: Political Stability & Absence of Violence/Terrorism

Country	Year								
	2007	2006	2005	2004	2003	2002	2000	1998	1996
	Est.	Est.	Est.	Est.	Est.	Est.	Est.	S.E.	Est.
Afghanistan	-2.37	-2.28	-2.02	-2.13	-2.03	-1.95	-2.73	0.41	-2.07
Bangladesh	-1.44	-1.45	-1.68	-1.14	-1.09	-0.84	-0.55	0.25	-0.89
Bhutan	0.67	1.30	1.14	0.85	0.77	0.63	0.48	0.41	0.84
Cambodia	-0.43	-0.40	-0.50	-0.47	-0.72	-0.71	-0.75	0.34	-1.41
Democratic People's Republic of Korea	0.35	-0.18	-0.26	-0.15	-0.01	0.29	-0.09	0.31	-1.83
Hong Kong, China	1.05	1.12	1.17	1.04	0.80	0.78	0.82	0.27	-0.01
India	-1.01	-0.94	-0.79	-0.94	-1.25	-1.01	-0.68	0.23	-1.12
Indonesia	-1.13	-1.25	-1.29	-1.57	-2.03	-1.61	-1.67	0.23	-0.81
Japan	1.02	1.08	1.01	1.04	1.17	1.17	1.06	0.23	0.90
Lao PDR	0.00	0.01	-0.30	-0.59	-1.04	-0.27	-0.73	0.41	1.05
Malaysia	0.20	0.32	0.47	0.26	0.30	0.39	0.28	0.23	0.64
Mongolia	0.66	0.74	0.93	0.77	0.94	1.06	0.80	0.31	0.59
Myanmar	-1.22	-0.82	-0.88	-0.94	-1.25	-1.33	-1.58	0.25	-1.25
Nepal	-2.13	-2.09	-2.35	-2.07	-1.83	-1.72	-1.18	0.41	-0.55
Pakistan	-2.44	-1.98	-1.71	-1.72	-1.70	-1.58	-1.01	0.23	-1.45
Philippines	-1.38	-1.33	-1.07	-1.24	-1.23	-0.70	-0.76	0.23	-0.49
PRC	-0.33	-0.33	-0.26	-0.17	-0.36	-0.21	-0.11	0.23	-0.26
Singapore	1.17	1.29	1.15	1.11	0.98	1.32	1.20	0.23	1.08
Republic of Korea	0.45	0.38	0.55	0.48	0.32	0.31	0.17	0.23	0.15
Sri Lanka	-1.96	-1.62	-1.35	-1.14	-0.95	-0.95	-1.58	0.25	-2.10
Thailand	-1.07	-0.93	-0.65	-0.46	-0.06	0.33	0.38	0.23	0.05
Viet Nam	0.31	0.42	0.36	0.19	0.16	0.31	0.22	0.23	0.31

Source: Kaufmann and Kraay (2008).

Annex Table 3d:
Governance Index for Asian Countries, 1996–2007: Regulatory Quality

Country	Year								
	2007	2006	2005	2004	2003	2002	2000	1998	1996
	Est.	Est.	Est.	Est.	Est.	Est.	Est.	S.E.	Est.
Afghanistan	-1.75	-1.68	-1.64	-1.63	-1.79	-1.94	-2.67	0.46	..
Bangladesh	-0.86	-0.87	-0.95	-1.05	-0.89	-0.94	-0.70	0.27	-0.22
Bhutan	-0.68	-0.17	-0.13	-0.71	-0.01	-0.48	-0.39	0.38	0.27
Cambodia	-0.51	-0.61	-0.50	-0.52	-0.37	-0.35	-0.17	0.31	0.04
Democratic People's Republic of Korea	-2.26	-2.29	-2.24	-2.26	-2.02	-1.93	-2.15	0.38	-2.23
Hong Kong, China	1.89	1.90	1.83	1.82	1.74	1.55	1.70	0.25	1.54
India	-0.22	-0.19	-0.21	-0.35	-0.33	-0.35	-0.11	0.23	-0.01
Indonesia	-0.30	-0.31	-0.48	-0.63	-0.65	-0.71	-0.31	0.23	0.35
Japan	1.05	1.19	1.17	1.12	1.00	0.58	0.83	0.25	0.50
Lao PDR	-1.08	-1.15	-1.20	-1.23	-1.37	-1.31	-1.48	0.35	-1.62
Malaysia	0.53	0.51	0.52	0.48	0.67	0.48	0.38	0.23	0.68
Mongolia	-0.34	-0.29	-0.37	-0.47	-0.37	-0.10	-0.11	0.34	-0.76
Myanmar	-2.23	-2.25	-2.24	-2.32	-2.02	-2.07	-1.90	0.30	-1.09
Nepal	-0.65	-0.62	-0.61	-0.55	-0.52	-0.55	-0.55	0.35	-0.72
Pakistan	-0.56	-0.44	-0.59	-0.89	-0.73	-0.80	-0.70	0.27	-0.38
Philippines	-0.13	-0.12	-0.05	-0.25	-0.06	-0.09	0.15	0.23	0.53
PRC	-0.24	-0.33	-0.26	-0.29	-0.39	-0.51	-0.28	0.23	0.15
Singapore	1.87	1.76	1.80	1.82	1.84	1.89	1.96	0.25	1.66
Republic of Korea	0.88	0.70	0.79	0.79	0.68	0.78	0.58	0.23	0.46
Sri Lanka	-0.11	-0.10	-0.21	0.02	0.13	0.21	0.25	0.27	0.46
Thailand	0.11	0.23	0.41	0.23	0.25	0.16	0.46	0.23	0.45
Viet Nam	-0.43	-0.58	-0.57	-0.49	-0.56	-0.71	-0.68	0.25	-0.32

Source: Kaufmann and Kraay (2008).

Annex Table 3e:
Governance Index for Asian Countries, 1996–2007: Rule of Law

Country	Year

	2007	2006	2005	2004	2003	2002	2000	1998	1996
	Est.	Est.	Est.	Est.	Est.	Est.	Est.	S.E.	Est.
Afghanistan	-2.00	-2.07	-1.89	-1.81	-1.77	-1.74	-2.02	0.32	-1.34
Bangladesh	-0.81	-0.82	-0.87	-0.95	-0.90	-0.79	-0.80	0.18	-0.77
Bhutan	0.49	0.60	0.58	0.42	0.44	0.18	0.22	0.29	-1.34
Cambodia	-1.06	-1.14	-1.14	-1.20	-1.17	-1.11	-0.93	0.19	-1.09
Democratic People's Republic of Korea	-1.03	-1.22	-0.98	-1.09	-0.85	-1.02	-0.79	0.27	-1.23
Hong Kong, China	1.40	1.46	1.47	1.37	1.30	1.10	0.91	0.17	1.14
India	0.10	0.16	0.13	0.05	0.03	0.01	0.19	0.16	0.29
Indonesia	-0.71	-0.77	-0.86	-0.82	-0.97	-1.01	-0.82	0.16	-0.37
Japan	1.39	1.42	1.35	1.32	1.31	1.30	1.43	0.16	1.53
Lao PDR	-0.96	-0.94	-1.03	-1.00	-1.11	-1.02	-0.94	0.23	-1.64
Malaysia	0.53	0.55	0.56	0.54	0.45	0.41	0.35	0.16	0.73
Mongolia	-0.41	-0.31	-0.20	0.07	0.07	0.23	-0.03	0.25	0.07
Myanmar	-1.41	-1.42	-1.60	-1.61	-1.61	-1.58	-1.26	0.20	-1.31
Nepal	-0.64	-0.62	-0.83	-0.63	-0.54	-0.38	-0.28	0.23	-0.15
Pakistan	-0.93	-0.85	-0.87	-0.87	-0.83	-0.79	-0.80	0.17	-0.59
Philippines	-0.59	-0.48	-0.44	-0.64	-0.60	-0.56	-0.53	0.16	-0.02
PRC	-0.45	-0.48	-0.42	-0.38	-0.45	-0.37	-0.44	0.16	-0.25
Singapore	1.79	1.76	1.81	1.81	1.69	1.54	1.42	0.16	1.74
Republic of Korea	0.82	0.69	0.78	0.70	0.65	0.79	0.74	0.16	0.70
Sri Lanka	0.06	0.08	0.05	0.01	0.04	0.16	0.00	0.18	-0.12
Thailand	-0.06	0.00	0.10	0.05	0.06	0.23	0.45	0.16	0.58
Viet Nam	-0.53	-0.51	-0.41	-0.53	-0.56	-0.61	-0.49	0.16	-0.65

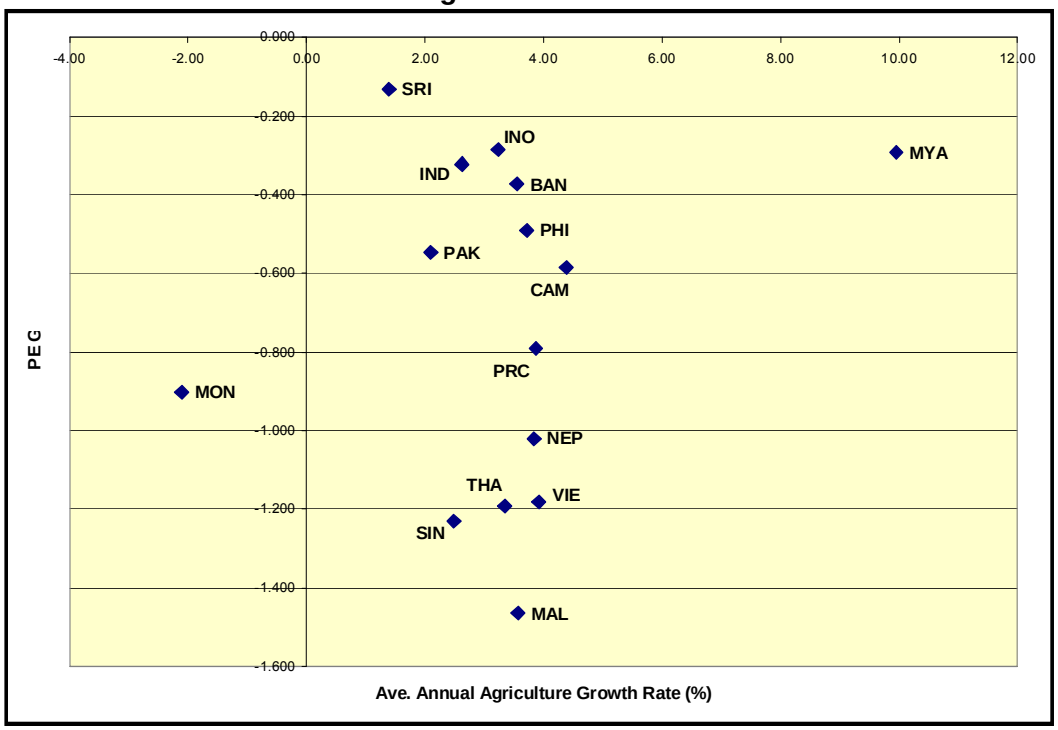
Source: Kaufmann and Kraay (2008).

Annex Table 3f:
Governance Index for Asian Countries, 1996–2007: Government Effectiveness

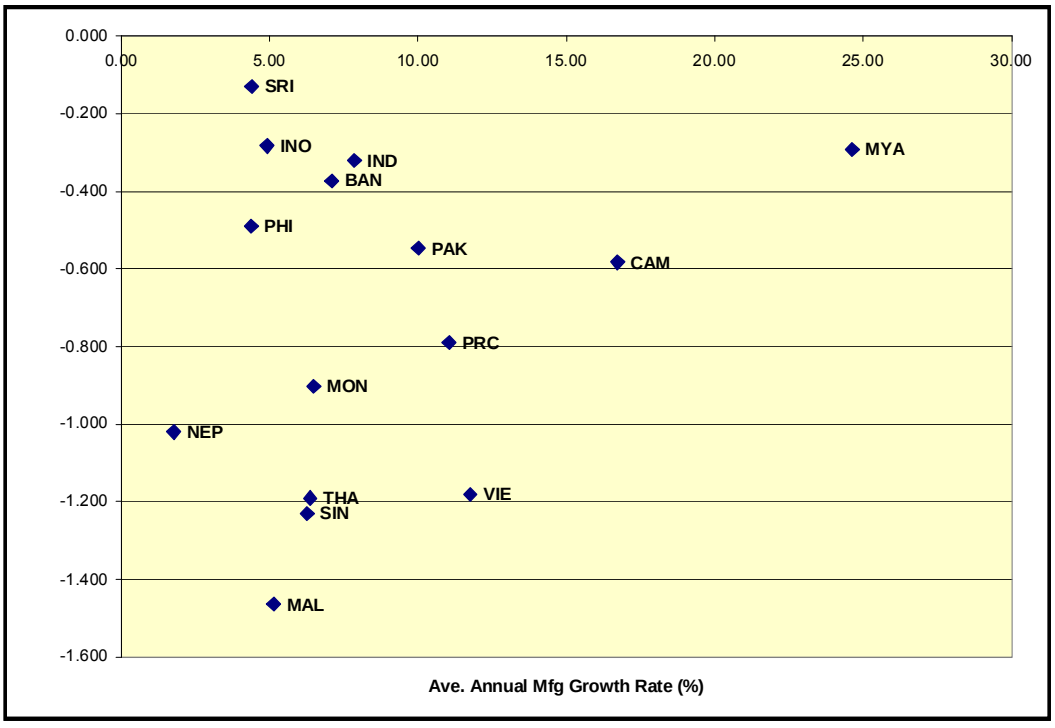
Country	Year								
	2007	2006	2005	2004	2003	2002	2000	1998	1996
Afghanistan	-1.33	-1.37	-1.24	-0.97	-1.26	-1.57	-2.11	0.19	..
Bangladesh	-0.81	-0.78	-0.89	-0.82	-0.70	-0.72	-0.52	0.16	-0.64
Bhutan	0.01	0.25	0.34	0.22	0.50	0.44	0.81	0.18	0.20
Cambodia	-0.82	-0.97	-0.92	-0.90	-0.77	-0.75	-0.84	0.17	-1.12
Democratic People's Republic of Korea	-2.10	-1.68	-1.80	-1.71	-1.79	-1.95	-1.88	0.18	-0.89
Hong Kong, China	1.80	1.80	1.64	1.59	1.43	1.28	1.10	0.16	1.20
India	0.03	-0.06	-0.11	-0.04	-0.04	-0.16	-0.17	0.15	-0.20
Indonesia	-0.41	-0.44	-0.46	-0.43	-0.55	-0.63	-0.52	0.15	0.14
Japan	1.32	1.46	1.17	1.11	1.16	1.03	1.08	0.15	1.38
Lao PDR	-0.81	-0.86	-1.04	-0.94	-1.03	-0.69	-0.77	0.18	-0.06
Malaysia	1.07	0.99	1.01	0.97	0.90	0.83	0.82	0.15	0.88
Mongolia	-0.70	-0.44	-0.38	-0.44	-0.28	-0.19	-0.35	0.18	-0.53
Myanmar	-1.67	-1.55	-1.63	-1.57	-1.31	-1.39	-1.20	0.16	-1.28
Nepal	-0.81	-0.82	-0.96	-0.78	-0.55	-0.44	-0.40	0.18	-0.25
Pakistan	-0.62	-0.55	-0.53	-0.53	-0.55	-0.60	-0.66	0.15	-0.52
Philippines	-0.01	-0.06	-0.08	-0.21	-0.17	-0.20	-0.19	0.15	-0.02
PRC	0.15	0.04	-0.08	0.00	-0.06	-0.03	-0.06	0.15	0.14
Singapore	2.41	2.22	2.17	2.26	2.19	2.08	2.21	0.15	2.31
Republic of Korea	1.26	1.14	1.00	0.94	0.92	0.95	0.77	0.15	0.92
Sri Lanka	-0.29	-0.31	-0.41	-0.37	-0.17	-0.10	-0.26	0.16	-0.44
Thailand	0.16	0.25	0.40	0.29	0.26	0.16	0.06	0.15	0.46
Viet Nam	-0.41	-0.38	-0.29	-0.43	-0.35	-0.45	-0.46	0.15	-0.23

Source: Kaufmann and Kraay (2008).

Annex Figure 1a:
PEG vs. Agriculture Growth Rate



Annex Figure 1b:
PEG vs. Manufacturing Growth Rate



Annex Figure 1c:
PEG vs. Services Growth Rate