

Discussion Paper Series

**RIEB**

Kobe University

DP2010-15

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and Poverty in Asia\***

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April 30, 2010

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# **Fiscal Stimulus, Agricultural Growth and Poverty in Asia <sup>\*</sup>**

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## **Abstract**

Recent debates on a sustainable recovery of the global economy have tended to overemphasise the “savings glut” hypothesis and the unavoidable imperative of higher consumption in China and other emerging Asian countries. That oversaving and not underinvestment is coming in the way of a quicker and more durable recovery is not just simplistic but misleading from a medium-term growth perspective for emerging Asian countries and other developing countries in this region. Drawing upon country panel data for developing countries and a sub-sample of Asian countries during the period 1991 to 2007, the present study makes a case for a bold and coordinated fiscal stimulus, directed to stimulating agricultural and overall growth, and mitigation of poverty and hunger. Our simulations further suggest that poverty reduction is likely to be larger if the fiscal stimulus is directed to social spending in health and education sectors. Indeed, if our simulations of fiscal impacts have any validity, the dire predictions of millions getting trapped in poverty and hunger may turn out to be exaggerated. The prospects of a strong recovery led by fiscal stimulus are thus *real* and *achievable*.

**Key words:** Government Expenditure, Fiscal Policy, Economic Growth, Agricultural Growth, Poverty, Asia.

**JEL codes:** C 21, C 33, E 62

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<sup>\*</sup> We are grateful to T. Elhaut for his support and guidance at all stages of this study. Raghendra Jha and Anil Deolalikar offered useful advice on econometric estimation. S. Jha graciously arranged for access to the rich database of ADB. Our thanks are also due to V. Camaleonte and S. Vaid for valuable research assistance. Research support from RIEB, Kobe University for the second author is highly appreciated. The views expressed, however, are personal and not necessarily of the institutions to which the authors are affiliated.

# **Fiscal Stimulus, Agricultural Growth and Poverty in Asia**

## **1.INTRODUCTION**

The seeds of the present recession were sown in the underpricing of risk and the resulting excessive leverage. Defaults on subprime mortgages led to repricing of risk. As a result, there were sharp falls in the prices of mortgage-backed securities, share prices and home values. Destruction of wealth in turn caused cuts in consumer spending, business investment and in commercial real estate values.

Continuing declines in the values of mortgaged-based securities and of the derivatives based on them fed fears of further mortgage defaults. Erosion of capital of financial institutions weakened their willingness to make loans. Thus a dysfunctional credit market emerged that no longer gave loans or responded to changes in the interest rates (Feldstein, 2009, Krugman, 2009a).

Total capitalisation of world stock markets almost halved in 2008 (i.e. nearly \$30 trillion of wealth disappeared). Market recovery so far is about \$2 trillion (Lin, 2009). Losses of this magnitude have significant wealth effects on consumption and saving.

Although governments in USA and Europe acted promptly and decisively, they failed to prevent the financial crisis from spreading to the real sector. Globally, industrial production declined by 28 per cent in the first quarter of 2009 before easing to a pace of contraction of 19 per cent in April (on a rolling quarterly basis). During the first quarter of 2009, exports in East Asia (e.g. China and Japan) declined by 50 percent or more, and in Korea by 43 per cent, presaging the largest trade contraction since 1929 (Lin, 2009). Other transmission channels through which the contagion spread include sharp reductions in investment, and remittances<sup>1</sup>.

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<sup>1</sup> Total FDI and private capital flows to developing countries are estimated to decline from \$1.2 trillion in 2007 to \$363 billion in 2009. Remittances are likely to fall from \$328 billion to \$305 billion (Lin, 2009).

The GDP growth rate in developing countries in 2009 is estimated to drop to 1.2 per cent, a precipitous decline from 8.1 per cent in 2007 and 5.9 per cent in 2008. Recent World Bank estimates show that the sharp deceleration of growth would trap 53 million more in poverty (living on less than \$1.25 a day), and 65 million on the higher cut-off of \$2 per day. If the recession persists, much larger numbers are likely to get trapped in poverty. Another dire forecast is that an average of 200,000 to 400,000 more children per year, a total of 1.4 to 2.8 million, may die during 2009 to 2015 if the crisis persists. While the gravity of the concerns raised cannot be disputed, the present study makes a strong case for the strategic role of agriculture in breaking out of this recession, and in mitigating poverty and other associated hardships.

## **2. WHY FISCAL STIMULUS?**

Experience has shown that in general monetary policy is ineffective in stimulating investment and consumption in excess capacity situations. Fiscal stimulus, on the other hand, has the potential of working by releasing bottlenecks to growth in developing countries<sup>2</sup>. It must, however, be bold, global, and generate an immediate and sustained increase in global demand and productivity.

There are two major limitations of current fiscal stimulus programmes. First, most developing countries are constrained by either fiscal space or/and foreign exchange reserves, and thus over a period of time will not be able to pursue counter-cyclical policies. Fiscal position was in large measure undermined by the fuel and food crises, resulting in expansion of subsidies. Moreover, an estimated one-third of developing countries have large current

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<sup>2</sup> For an emphatic endorsement, see Krugman (2009b). He in fact argues that fiscal expansion does not crowd out private investment — on the contrary, there's crowding in, because a stronger economy leads to more investment. So, fiscal expansion increases future potential, rather than reducing it.

account deficits of 10 per cent of their GDP. Second, contrary to Keynesian theory, the so-called Ricardian equivalence theorem points to the possibility that households adjust their behaviour for consumption or saving on the basis of expectations about the future. Any fiscal stimulus package—spending or tax cuts—is then perceived as a liability which will need to be repaid in the future. In such a situation, the multiplier could be less than 1, with the GDP seen as given so that an increase in government spending does not lead to an equal rise in other parts of GDP. A case in point is Japan's experience during the "lost decade". The government was aggressive in implementing its fiscal stimulus. In 1991, public debt was 60 per cent of the country's GDP. By 2002, it had risen to 140 per cent, implying a large stimulus of 7 per cent of GDP per year. Yet, Japan did not get out of the crisis. This is because people chose to increase saving, which mitigated the effects of government spending. So the lesson is clear: even if governments around the world agree to implement coordinated fiscal stimulus packages, there is still the issue of whether these fiscal programmes will increase aggregate demand enough to offset the excess capacity that has been built up during the 2002-07 bubble (Lin, 2008, 2009).

If public spending delivers higher levels of investment and rational economic agents believe that their income will not be taxed for repayment in the future, the Ricardian equivalence effect will be weak, if any. If policy makers can design a system that allows projects/programmes to generate enough returns to repay themselves, the chance of success is high. So, if governments use fiscal stimulus to release bottlenecks to growth, economic growth will be accelerated and marginal returns to private investment will also be higher.

China's economic stimulus of 1998-2002 illustrates this view. In the midst of the Asian financial crisis, when sharp economic slumps in Indonesia, Korea, Malaysia, Philippines, and Thailand prompted all the neighbours to depreciate their currencies, China issued an estimated RMB 660 billion in bonds specifically to finance infrastructure, inducing four

times more of bank loans, private and local government investment. As a result, China went through deflation but recorded an average growth rate of 7.8 per cent. An important feature of the stimulus was that it was targeted to the release of bottlenecks to growth. Examples include the highway system, port facilities, telecommunications and education. The Chinese economy got out of deflation in 2003, and growth of GDP accelerated to 10.8 per cent in 2003-08. This then resulted in an increase in revenue which brought about a reduction of public debt from 30 per cent of the GDP in the 1990s to 20 per cent in 2007 (Lin, 2009).

High return opportunities may be limited in developed countries where a high level of investment and consumption has already been realised under the market system. By contrast, such projects tend to abound in developing countries-especially in the rural areas. Clearly, some fraction of fiscal resources must be injected in developed countries that are the epicentre of the crisis, but the main objective must be to create demand quickly and efficiently. So channelling of investment to where it can be most effectively utilised – especially in the developing countries-is a high priority. Infrastructural investment –both domestically and regionally-can generate strong backward and forward linkages with other sectors and facilitate growth and further investment in traditionally poorer areas.

However, there is one important difference in the present situation. In the past crises, some countries could depreciate their currencies and increase exports to get out of the recession. But in the present global slowdown, currency depreciation and greater exports are not an option. This of course does not rule out greater trade *within* a region-for example, *within* Asia and/or *between* developing regions and/or *between* emerging economies. China's rapid expansion of trade with Japan is a case in point. But this is more a question of exploitation of intra-region or inter-region trade potential and not one of using "beggar thy neighbour policies". While erosion of trade of East Asian countries (e.g. China) with USA

and Europe during the last two quarters may not be fully compensated, there are substantial possibilities of trade expansion within Asia and with other developing countries (Petri, 2006).

Not only is this opportunity glossed over or sidetracked in recent debates but there is also an overemphatic endorsement of the “savings” glut hypothesis and consequently higher consumption in China, in particular, and India and other high saving emerging countries, in general, to prevent the global slowdown from turning into a deep recession<sup>3</sup>. In line with the pronouncements of US Treasury and a galaxy of development economists, various researchers from the Asian Development Bank (notably Park and Shin, 2009, Jha et al. 2009) have drawn attention to rebalancing of growth in emerging Asian countries- a euphemism for raising consumption. While recognising that both underinvestment and oversaving contribute to the current account surplus, Park and Shin (2009) assert that the contribution is predominantly from oversaving rather than underinvestment<sup>4</sup>. While as an empirical observation this is not false, it is not sufficient to shift the policy emphasis from raising investment to cutting down oversaving<sup>5</sup>. From a medium-term perspective, the impediments to agricultural growth are many and persistent. These include limited access to markets, weak financial intermediation, fragile extension systems, and high vulnerability to diverse market and non-market risks. As market failures are rampant, public expenditure has a vital role. Moreover, public investment multipliers-including not just infrastructure but also education and health- are generally found to be larger than public expenditure ones (net of investment). Indeed, as pointed out by Sachs (2009), the present crisis is an opportunity to *rebalance* the public and private sectors, and to link the short-term macro stimulus with the long-term sustainability agenda.

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<sup>3</sup> See, for example, Prasad (2009). For a reexamination of the “savings glut” hypothesis, see Gaiha et al. (2010).

<sup>4</sup> This is buttressed by decompositions of growth in Jha et al. (2009).

<sup>5</sup> In fact, the Park-Shin analysis (2009) is deeply problematic both methodologically and interpretationally. For details, see Gaiha et al. (2010).

Further doubts arise about the rebalancing argument if account is taken of recent estimates of consumption growth in emerging Asia. A recent issue of *The Economist* (June 25<sup>th</sup>, 2009) draws attention to Asia's emerging economies bouncing back. Their GDP grew by an annualised 7 per cent in the second quarter of 2009.

**(Figure 1 to be inserted around here)**

Consumers' appetite to spend varies hugely across this region. In China, India and Indonesia spending has increased by annual rates of more than 5 per cent during the global downturn. In China, real spending has grown at an impressive rate of 9 per cent. Elsewhere in the region, however, spending has stumbled, squeezed by higher unemployment and lower wages.

During the past five years consumer spending in emerging Asia has grown by an annual average of 6.5 per cent, much faster than in any other part of the world. Consumption as a proportion of GDP has fallen but that is because investment and exports have grown even faster and not because spending has been weak. Relative to American consumer spending, Asian consumption has soared, as shown in Figure 1.

Nonetheless China has done much to boost consumption-rural residents are given subsidies for buying vehicles, televisions and refrigerators-as there is huge potential for higher consumption in the rural areas when incomes rise. The government has also introduced social safety net measures-spending more on health care, pensions and payments to low income households. These could lead low income households to save less and spend more. But a bigger test of Asian governments' resolve to shift the balance of growth from exports towards domestic spending is, as argued in different issues of *The Economist* and

elsewhere, whether they will allow their exchange rate to appreciate<sup>6</sup>. A revaluation would lift consumers' real purchasing power and allow firms to shift production towards domestic demand. That this is not just oversimple but also a short-sighted and potentially misleading view is elaborated below. Specifically, fiscal stimulus directed to investments in rural and other areas has considerable potential for expanding output and incomes in a sustainable way, through domestic and external demand, without drastic exchange rate adjustments<sup>7</sup>.

### 3. MACRO POLICY OPTIONS

Recent assessments (Krugman, 2009a, b, Feldstein, 2009, ADB, 2009, *The Economist*, 2009) of fiscal stimulus reflect a growing consensus on the continuing need for it until global recovery stabilises. While there is cautious endorsement of sustainability of fiscal expansion in emerging and other developing countries, depending on the fiscal space and debt burden, there is also awareness of the painful lessons learnt from an early withdrawal of fiscal stimulus during the Great Depression of the 1930s and the more recent experience of the recession in Japan in the 1990s. In fact, there are some -notably Krugman (2009 b)- who are emphatic in their endorsement of a second round of fiscal stimulus.

A general consensus is that all *major* actors need to respond quickly and in a more coordinated manner -endorsed also by the recently concluded G-20 Summit in Pittsburgh. These actors include developing countries that are now responsible for a large share of the global economy and trade flows.

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<sup>6</sup> In an admirably clear and cogent exposition, Corden (2009) cautions against a simplistic view of exchange rate adjustments -especially appreciation of the *renminbi*- as key to correcting global current account imbalances. He makes two important points: (i) the current account balance has not been planned by the central authorities but instead has been an unplanned by-product of a variety of development and policies-including rapid productivity growth. Exchange rate policy has been just one key element in this story. (ii) While exchange rate policy can and does affect the surplus, it was targeted on a different objective-to maintain employment in export industries and to curb speculative attacks.

<sup>7</sup> On this, see Rodrik (2007, 2009).

In general, developing countries are in some respects better poised to deal with the shocks that have rippled through the global economy, relative to the earlier crises. Their macro-economic policies -including their fiscal and external positions- are designed to make them less vulnerable to such shocks. Sovereign debt is better managed than at the time of the East Asian financial crisis while flexible exchange rates allow external shocks to be absorbed less disruptively. The number of extremely poor has also declined appreciably-by more than 300 million since the East Asian Financial Crisis (Chen and Ravallion, 2008). Diminished inflationary expectations together with reduction of commodity prices (for net importers) have further eased macro-economic strains for some developing countries.

There are two main policy tools- monetary and fiscal policies- that developing countries must combine in a contextually appropriate manner. It may be imperative for some to tighten monetary policy by raising interest rates to avoid excessive currency depreciation or capital outflows while others may have room to lower interest rates to stimulate investment in sectors in which they have comparative advantage.

There is a variety of fiscal options. Injection of domestic demand could help offset the loss of foreign demand. Public investment -especially in infrastructure- is a key option. Of particular importance is rural infrastructure, given the disparity between rural and urban areas<sup>8</sup>. Another area of investment is social protection and human development. Examples include *conditional* cash transfers to keep disadvantaged children in school, public works employment (a case in point is National Rural Employment Guarantee Scheme in India) and subsidies on inferior food. Such fiscal stimulus is likely to work in countries with healthy reserves, current account surplus or small deficits, and fiscal balance. However, the policy dilemma that confronts governments in developing countries is whether they can respond in a countercyclical manner by increasing domestic demand without risking their fundamentals-

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<sup>8</sup> See, for example, the evidence on easier market access benefiting smallholders more than proportionately in an Indian state (Shilpi and Umali-Deininger, 2007).

fiscal position, debt level, domestic inflation and the banking sector. Few countries have scope to do this while others are constrained fiscally (India more than China, for example) or experiencing capital flight out to safer havens.

#### 4. EVIDENCE ON ASIA

Given the focus of our study on Asia, a review of this region's experience is given below. Here we draw upon Jongwanich et al. (2009). Overall the fiscal stimulus has been too small to achieve potential output, as shown in Table 1. Even the relatively strong package in China covers only half the output gap. Most stimulus efforts cover much less. In South Asia, the problem has been lack of fiscal space. In others, failure to manage the stimulus (e.g. absorptive and institutional capacity) has been a constraint.

**(Table 1 to be inserted around here)**

The results given in Table 2 show the effects of fiscal stimulus of 4 countries/regions.<sup>9</sup> A brief summary of the results is given below. First, the impacts of the stimulus packages add between 0.2 per cent and 6 per cent to GDP growth in 2009, and between 0.9 per cent and 5.5 per cent in 2010. Second, even though the stimulus packages are large, and the impacts on growth positive, the stimulus packages will not reverse the impacts of the crisis in 2009. China is an exception as it benefits from its own large stimulus package. Third, all countries and regions, except Other Developing Asia, will experience positive growth at the end of 2010 *despite* the financial crisis. Fourth, most countries/regions are projected to experience a significant boost in their exports, especially for manufactured products. Services and agricultural exports are also projected to increase. Somewhat surprisingly, China is projected to see a significant rise in agriculture and processed food exports but a reduction in services

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<sup>9</sup> The results for Japan, China, North America OECD, and European OECD are omitted. For details, see ADB (2009).

exports. Fifth, in general, protectionism has a negative impact on the countries/regions that follow that route. India and Southeast Asia stand out as they could impact other regions in case they raise their tariffs to binding levels. China, on the other hand, lacks protectionist potential from raising applied tariff rates to binding rates in the Asia region. Finally, although few countries/regions experience a rise in exports, resulting from trade diversion created by accentuating tariff preferences for regional trade partners, the overwhelming effect is to reduce trade. Southeast Asia's exports decrease the most, followed by East Asia.

**(Table 2 to be inserted around here)**

## **5. EXIT OPTIONS AND INFLATIONS IN ASIA**

Our analysis will demonstrate significant growth acceleration through fiscal stimulus in a sample of Asian countries. As fiscal policy acts over a period-especially infrastructure spending-an inflationary impact in the short-run is not unlikely. However, the balance of evidence continues to point to the imperative of further fiscal stimulus. A related issue is whether it is also necessary to tighten monetary policy to further undermine inflationary tendencies. However, any change of policy stance must be informed by a clear understanding of source of inflation in Asia. An important recent contribution (Jongwanich and Park, 2008) throws valuable light. In particular, the focus is on the relative importance of demand-pull and cost-push factors. A notable feature is that the analysis is based on a sample of Asian countries over the period 1996Q1-2009Q1<sup>10</sup>.

Briefly, the main cost-push factors are international oil and food prices, while the main demand-pull factors are excess aggregate demand, proxied by the output gap, and inflationary expectations (defined as a function of lagged domestic inflation). The implications of decomposition of inflation into these factors have policy significance. In the case of cost-push

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<sup>10</sup> The sample of countries includes China, India, Indonesia, Korea, Malaysia, Philippines, Singapore, Thailand and Vietnam.

inflation- driven by the rising input costs of goods and services- a marked slowdown and rising unemployment are likely to accompany higher inflation. A tight monetary policy would come with the high cost of slower growth and higher unemployment. Nor would loosening monetary policy in response to declining global oil and food prices help in pushing up growth and employment. In contrast, tightening monetary policy would contain inflation if inflation were of the demand-pull type. In that case, a tight monetary policy would dampen aggregate demand.

Inflationary expectations reinforce the case for monetary policy, regardless of the source of inflation. There is often a risk that inflationary expectations get entrenched and cause a cost-price spiral. A case in point is the stagflation experience of industrialised countries in the 1970s, triggered by the 1973-74 oil price shock. In other words, even if there is cost-push inflation, inflationary expectations may be formed, requiring monetary policy intervention.

The upshot is that monetary policy will continue to have a role in curbing inflation. Combining it with the expansionary effect of fiscal stimulus, a larger output gap is not unlikely. If, however, as our analysis suggests, the fiscal stimulus is contingent on better infrastructural support, and agricultural expansion, the trend output growth without inflation may also accelerate and thus offset the enlargement of the output gap. A subtle balancing of a gradually tightening monetary stance and more effective but continuing fiscal stimulus would allay inflationary apprehensions. From this perspective, this analysis of inflation offers some new insights into why an early exit is not warranted.

## **6. ECONOMIC ANALYSIS**

### *Objectives*

The objective of our analysis is to focus on the potential of public expenditure for growth and poverty reduction in a sample of developing countries. Our points of departure from the

extant literature are the following: first, an attempt is made to analyse the effects of public expenditure and its two components: infrastructure and net of infrastructure, on agricultural and overall growth in several different specifications. In other variants, we examine the separate effects of agriculture and different components of public expenditure-including a reclassification of public expenditure on infrastructure and health and education- on overall growth. Second, combining these results with a range of poverty-growth elasticities computed under different assumptions in Imai et al. (2010), we offer an assessment of the impact of fiscal stimulus and its components-through overall and agricultural growth- on poverty in Asia and the Pacific Region. A limitation of our analysis, however, is that it is confined to the contemporaneous impact of fiscal stimulus<sup>11</sup>.

### *Specification*

The objective of the econometric analysis is to assess the impacts of government expenditure on the growth rates of per capita GDP and agricultural value added, after controlling for the effects of other variables. Total public expenditure as an aggregate, and its disaggregation into infrastructure and non-infrastructure spending are considered separately. This analysis is supplemented by counterfactual simulations, focusing on their poverty impacts.

To focus on GDP per capita growth, we estimate the following model:

$$\Delta(GP_{i,t}) = \beta_0 + \beta_1 \Delta(INF_{i,t}) + \beta_2 \Delta(NetINF_{i,t}) + \beta_3 \Delta(AGP_{i,t}) + \beta_4 initialGP_{i,t} + \beta_5 Trade + \beta_6 Crisis * Asia + Yeardummy + Countrydummy + u_{i,t} \quad (1)$$

where  $\Delta(GP_{i,t}) = GP_{i,t} - GDP_{i,t-1}$ ;  $\Delta(INF_{i,t}) = INF_{i,t} - INF_{i,t-1}$ ;

$$\Delta(NetINF_{i,t}) = NetINF_{i,t} - NetINF_{i,t-1} \quad \text{and} \quad \Delta(AGP_{i,t}) = AGP_{i,t} - AGP_{i,t-1}$$

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<sup>11</sup> Data constraints precluded a broader focus.

Note that  $\beta_1$ ,  $\beta_2$  and  $\beta_3$  are central to our purpose. As the variables are in log, the coefficient estimates of  $\beta_1$ ,  $\beta_2$  and  $\beta_3$  represent the elasticity of per capita GDP growth with respect to (i) growth of government infrastructure expenditure, (ii) growth of government expenditure net of infrastructure or growth of non-infrastructure spending, and (iii) agricultural growth per capita. We also test whether high debt-GDP ratio has an adverse effect on growth. The fiscal multipliers in the long-run may also be lower as fiscal expansion is not sustainable when the debt-GDP ratio is high. Besides, whether per capita agricultural growth affects per capita GDP growth is examined.

Similarly, we estimate the determinants of per capital agricultural growth as specified below:

$$\Delta(AGP_{i,t}) = \alpha_0 + \alpha_1 \Delta(INF_{i,t}) + \alpha_2 \Delta(NetINF_{i,t}) + \alpha_3 initialAGP + \alpha_4 Trade + \alpha_5 Landpc_{i,t} + \alpha_6 Crisis * Asia + Yeardummy + Countrydummy + \varepsilon_{i,t} \quad (2)$$

Three stage least square (3SLS) estimator is applied here to estimate equations (1) and (2) to circumvent possible reverse causality between, say, GDP per capita growth and agricultural value added growth per capita, among others. Total public expenditure, infrastructure spending and government expenditure net of infrastructure were instrumented by their lagged values, and country and time effects in separate equations, respectively, while they are used as right side variables in overall growth equations. In addition, using 3SLS, we also allow for contemporaneous correlation between  $u_{i,t}$  and  $\varepsilon_{i,t}$ .

### *Data*

The data for the present study are taken from IMF's Government Financial Statistics (GFS), Asian Development Bank's key indicators and World Development Indicators (WDI).

The total sample consists of 23 countries of Asia, Latin America and Africa<sup>12</sup>. The period covered is from 1993 to 2006. Because of missing observations in government expenditure data, it was difficult to construct annual time-series for most of the countries. While realising it is not an ideal solution, we have divided the entire period into 7 sub-periods by taking 2 year average for all variables (that is, 1993-4, 1995-6, and so on up to 2005-6).

We have modified the IMF and ADB data on government expenditure classified by its functional outlay into two components of expenditure categories<sup>13</sup>: (a) expenditure on infrastructure; (b) total expenditure minus infrastructure expenditure. Expenditure on infrastructure is the sum of expenditures on electricity, gas and fuel, and transport and communication.

The variables used in the present study are listed below.

GP: Log of GDP per capita (constant US\$ in 2000)

AGP: Log of per capita agricultural value added (constant US\$ in 2000)

TE: Log of total government expenditure in value (constant US\$ in 2000)

INF: Log of government expenditure on infrastructure (constant US\$ in 2000)

NetINF: Log of total government expenditure minus infrastructure expenditure (constant US\$ in 2000)

Trade: Log of share of trade in GDP

Debt ratio: Log of share of central government debt to GDP

Working population ratio: Log of share of population aged 16-64 to total population

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<sup>12</sup> The countries are Bangladesh, Cambodia, India, Indonesia, Nepal, Philippines, Sri Lanka, Brunei, Malaysia, Maldives, Thailand, Mongolia for Asia; Costa Rica, Guatemala, Mexico, Panama for Latin American Countries; Burundi, Cameroon, Egypt, Ethiopia, Kenya, Tunisia and Zambia for Sub-Saharan African countries. These countries are selected only based on the availability of relatively complete data of government expenditure. We run the regressions for total sample countries and only for Asian countries.

<sup>13</sup> Public expenditure refers to central government expenditure only for all countries except India. We have used state-level government expenditure for India as a large share of expenditure on agriculture and rural areas is undertaken by state governments (Fan et al., 1999).

Land per capita.: Log of arable land (hectare) per person

Initial GP: Log of initial value of per capita GDP (constant US\$ in 2000)

Initial AGP: Log of initial value of per capita agricultural value added (constant US\$ in 2000)

Crisis\*Asia: A dummy variable for whether a country belongs to Asia region and the period is 1997-8

Crisis\*Sea: A dummy variable for whether a country belongs to Southeast Asia region and the period is 1997-8.

Given the importance of public expenditure on health and education-especially from a medium term perspective-a sub- section is devoted to reestimation of growth and poverty reduction due to a broadening of public expenditure to include physical infrastructure and health and education.

## 7. ECONOMETRIC RESULTS

### *Public Expenditure Impact*

Table 3 provides the econometric results to estimate the impact on public expenditure on growth. Case A, based on the complete sample, shows a significant positive contribution of government expenditure to overall economic growth: the elasticity of per capita GDP growth with respect to the growth of total expenditure is 0.669. The negative coefficient of the interaction term of Asian Financial Crisis and Asian countries (Crisis\*Asia) confirms that Asian countries were more affected from the crisis in 1997/98 than the rest of the sample.

**(Table 3 to be inserted around here)**

Turning to agricultural growth (Case B), government expenditure has a positive role. The growth elasticity of per capita agriculture value added with respect to government total expenditure growth is 0.655. The positive coefficient of initial agriculture GDP per capita

implies divergence (i.e. the difference in per capita agricultural value added between sample countries is expected to widen).

The important findings from the sub-sample of Asian countries are the following. The significant role of public expenditure on overall growth is also evident in the sub-sample of Asian countries, and it is in fact larger (Case C). A 1 percent higher expenditure growth increases GDP per capita growth by approximately 1.29 percent. Public expenditure growth shows a strong association with agricultural growth as well-the elasticity being 1.25. In large measure, the differences in the results are due to the use of different samples (aggregate and the Asian sub-sample).

#### *Impacts of Infrastructure and Non-Infrastructure Expenditure*

Table 4 examines the impact of public expenditure on infrastructure and non-infrastructure on growth. The result in Case A further confirms that per capita GDP growth is positively and significantly influenced by *both* public infrastructure spending and non-infrastructure spending in the aggregate sample: a 1 percent increase in the growth of non- infrastructure expenditure increases GDP per capita growth by 0.31 percent whilst a 1 percent change in infrastructure expenditure is associated with 0.047 percent change in GDP growth. While this may seem intriguing in view of the evidence cited earlier, it is not so since infrastructure is defined somewhat narrowly (education and health, for example, are excluded). As expected, agricultural growth has a significant positive effect on overall growth even after allowing for the effects of infrastructure and non-infrastructure spending. Specifically, the elasticity of per capita GDP growth with respect to per capita agricultural growth is 0.134. The debt-GDP ratio is negatively associated with economic growth, implying the constraining influence of debt repayment on public investment. The negative coefficient estimate of the interaction

term of *Crisis* and *Asia* (i.e.  $Crisis * Asia$ ) implies that per capita GDP growth rates of Asian countries were more negatively affected by the Asian Financial Crisis.

**(Table 4 to be inserted around here)**

In Cases B, there is a strong influence of non-infrastructure expenditure on per capita agricultural growth: a 1 percent increase in spending increases per capita agricultural value added growth by 1.11 percent. The growth elasticity of agricultural value added with respect to infrastructure expenditure is also positive but relatively small (0.08 per cent). There are at least two reasons why this effect is small. One is the narrow focus of infrastructure spending. Another is the failure to distinguish between rural and urban infrastructure spending. This is a data constraint that we are unable to overcome. Nevertheless these results further confirm the important role of increased government spending in promoting agricultural growth.

Turning to the results obtained from the sub-sample of Asian countries in Case A of Table 5, we find that both components of government expenditure are positively associated with per capita GDP growth: the elasticity of per capita GDP growth with respect to infrastructure expenditure growth and to net expenditure growth are 0.087 and 0.465, respectively. The positive influence of non- infrastructure expenditure is also observed in the agricultural value added per capita growth equation in Case B of Table 5: a 1 percent increase in this expenditure is associated with 0.85 percent increase in growth of agricultural value added per capita. The effect of infrastructure spending on agriculture growth is positive but statistically not significant (or not significantly different from 0). For the reasons stated earlier, this is not so surprising.

**(Table 5 to be inserted around here)**

### *Extensions*

We have carried out a few extensions using 3- year averages instead of 2- year averages mainly as a robustness check<sup>14</sup>. Here a few changes have been made to the previous specifications. First, government infrastructure expenditure is broadened to include government expenditure on education and health services. Hence infrastructure expenditure now refers to both physical and social government spending. Second, we have included money supply or M2 to examine the effects of monetary policy on economic growth. In other words, this is a step towards a closer integration of the real and monetary markets.

With the aggregate sample, a positive and significant coefficient estimate of government expenditure on physical infrastructure and health and education is obtained. If a government raises this component of public expenditure by one percent, 0.282 percent higher overall economic growth is likely.

After controlling for the effects of money supply, we obtained a positive effect of infrastructure on economic growth. The effect of money supply on per capita GDP growth is positive. With or without a control for money supply, agricultural growth has a substantially greater effect on overall growth (the elasticity ranges from 0.38 per cent to 0.41 per cent).

In sum, the main findings are summarised as follows. First, agricultural growth has a substantial effect on overall growth. Second, public expenditure growth has a positive effect on overall growth, as also growth of the components of the former (infrastructure and non-infrastructure spending). Third, the effect of growth of non-infrastructure spending is often considerably larger than that of infrastructure spending. This is not surprising for two reasons: narrow definition of infrastructure spending, and failure to account for its longer-term impact. Finally, agricultural growth is also highly sensitive to growth of public

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<sup>14</sup> It would be ideal to use a longer time span (e.g. 6- year averages) instead of 3- year averages to test the longer-term effect, but the data do not allow this. The econometric results are not shown to save the space, but will be provided on request.

expenditure or non-infrastructure spending, and less so to infrastructure spending. The latter is presumably a consequence of our failure to disaggregate infrastructure spending into rural and urban.

## 8. SIMULATIONS OF GROWTH AND POVERTY REDUCTION

A selection of our results is given in Table 6 and 7, based on counterfactual simulations of increases in public expenditure, and its components, on agricultural and overall growth. Combining these with poverty elasticities of overall growth and agricultural growth, we obtain likely impacts of fiscal stimulus on the poverty head-count ratio<sup>15</sup>. Efficacy of different routes of fiscal and agricultural expansion is examined. The important role of fiscal stimulus in reviving the Asian economies and in maintaining the progress towards the MDG of halving of the head-count index of poverty is illustrated – in both *relative* and *absolute* terms.

**(Table 6 to be inserted around here)**

As shown in Table 6, with a 10 per cent higher growth of public expenditure, the growth rate of GDP per capita will increase by 20.85 per cent (in comparison with the reference case), and with a doubling of the growth of public expenditure, the GDP growth rate accelerates by 41.14 percent. Although the reductions estimated in the poverty ratio- rising from 6.80 per cent in the reference case to 8.26 per cent and 9.70 per cent in the two counterfactual scenarios of higher growth of public expenditure- seem small, the reductions in the number of poor (on the \$1.25 per day criterion) are large: 10.30 and 20.44 million, respectively.

In the lower panel of this table, we assess the impact through a higher growth rate of agricultural value added per capita. Note that the poverty elasticity with respect to

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<sup>15</sup> For computational details of poverty elasticities with respect to GDP per capita and agricultural value added per capita, see Imai et al. (2010).

agricultural value added is less than half that of GDP per capita (-0.52 as against -1.22)<sup>16</sup>. So, while agricultural growth rate accelerates and there are small reductions in the poverty head-count ratios, the reductions in the number of poor are still substantial (4.25 million and 8.50 million, respectively). It follows, therefore, that fiscal stimulus operating through agricultural growth continues to have considerable potential for poverty reduction<sup>17</sup>.

A disaggregated analysis of fiscal stimulus is given in Table 7. To avoid cluttering the text, a selection of results is given.

**(Table 7 to be inserted around here)**

Given the narrow definition of infrastructure, as also the fact that our analysis is confined to the contemporaneous impacts, it is not surprising that a more rapid growth of infrastructure spending has small growth and poverty impacts while those of non-infrastructure spending are substantially larger, operating through acceleration of GDP and agricultural growth. With a 20 per cent faster growth of non-infrastructure spending, for example, agricultural growth accelerates from 2.30 per cent in the reference case to 4.05 per cent, and the number of poor drops by just under 7 million.

To supplement these results, Table 8 illustrates the likely effects of combining government expenditure on health and education with that on infrastructure on growth and poverty. There is a substantial decline in the number of the poor when physical and social infrastructure spending rises. Relative to the reference case, with a 10% (20%) higher growth in physical and social spending, overall growth rate will increase by 3.37% (6.73%). The estimated reduction in the number of poor is 2.52 (5.04) million. This is in striking contrast to our earlier results implied by simulated increases in physical infrastructure expenditure. For instance, the simulation exercise suggests that, with a 10% (20%) higher growth in physical

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<sup>16</sup> For estimation details, see Imai et al. (2010).

<sup>17</sup> Note that these simulations exclude China.

infrastructure spending, barely 0.27 (0.64) million poor cease to be poor. The importance of social spending in reducing poverty is thus strongly corroborated by our simulations. Given the importance of social spending in the medium –term, the effects on growth and poverty reduction are likely to be larger.

**(Table 8 to be inserted around here)**

Juxtaposed against the trapping of 53 million in poverty in the developing world due to the global slowdown, as noted by Lin (2009), our simulation results are reassuring. Whether a bold and coordinated fiscal stimulus directed to agriculture and rural areas in Asia and the Pacific region is feasible, time alone will confirm.

## 9. CONCLUSIONS

To put the analysis in perspective, we reject the savings glut hypothesis as sufficient to shift the emphasis from investment to cutting oversaving in emerging Asian countries as a way out of the global slowdown. Arguing that underinvestment must remain the focus of macro policies, a case is made for a bold and coordinated fiscal stimulus.

Drawing upon country panel data for developing countries and a sub-sample of Asian countries during the period 1991 to 2007, we have analysed the effects of government expenditure on GDP and agricultural value added growth, and their implications for poverty reduction. One of our main findings is that, *despite* the decline in the share of agriculture in GDP, it has a major role in growth acceleration. But, more importantly, in the context of the global slowdown and faltering signs of recovery, the case for a bold fiscal stimulus is corroborated. Although impacts of public expenditure in the aggregate as well as of its components -especially infrastructure spending- vary depending on the model and sample used, their growth impacts are positive and, in some cases, *large* and *robust*. While the

impact of infrastructure spending is small relative to that of non-infrastructure spending, this is not surprising given the narrow definition of infrastructure used.

We then broadened our measure of public expenditure on infrastructure by including health and education to allow for their potential for medium-term growth acceleration. Not only are the growth effects larger but also the poverty reduction is greater. If accepted at face value, and conditional on the feasibility of a bold and coordinated fiscal stimulus, the dire predictions of more than 50 million getting trapped in poverty because of the global slowdown appear exaggerated. Besides, if mechanisms are evolved to direct the fiscal stimulus to the rural areas where both physical and social infrastructure are far from adequate to sustain the growth impulse-as illustrated by the case studies of rural infrastructure in selected Asian countries- the payoff in terms of poverty reduction may surpass seemingly optimistic predictions.

In conclusion, the prospects of a strong recovery led by fiscal stimulus are real and achievable.

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**TABLE 1**  
**Fiscal Stimulus Plans of Selected Developing Asian Countries**

Fiscal stimulus	Countries
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More than 5 per cent of GDP	China, Kazakhstan, Papua New Guinea, Vietnam
Between 2 per cent and 5 per cent of GDP	India, Philippines, Vietnam
Between 0.5 per cent and 2 per cent of GDP	Bangladesh, Cambodia, Indonesia, Pakistan
Less than 0.5 per cent of GDP	Sri Lanka

Source: ADB (2009).

**TABLE 2**  
**Impacts of Stimulus Packages on Asian GDP Growth, 2009 and 2010 (Percent of Real GDP)**

Country/Region	Projected GDP Impacts from Slowdown in OECD		Projected Fiscal Stimulus Impacts <sup>a</sup>		Gap <sup>b</sup>		
	2009	2010	2009	2010	2009	2010	Cumulative Gap in GDP (%) <sup>c</sup>
China	-3.9	1.4	6.0	5.5	2.1	6.9	9.1
Other Developing Asia	-2.8	0.9	0.2	1.5	-2.6	2.4	-0.3
East Asia	-3.8	1.4	3.5	3.0	-0.3	4.4	4.1
India	-4.1	1.3	3.2	2.4	-0.9	3.7	2.8
South Asia	-3.6	1.2	2.3	2.2	-2.0	3.3	1.2
South East Asia	-3.4	1.2	1.6	2.1	-1.2	3.4	2.2

Source: Jongwanich et al. (2009)

a Projected GDP is the static impact on the Asian countries of fiscal stimulus packages where actual growth may be greater or smaller depending on the policies of individual countries, such as fiscal stimulus or protectionism.

b The potential gap is the difference between the impacts from the economic slowdown and the impacts from the projected fiscal stimulus packages.

c Cumulative numbers are not the simple addition of the two years but are compound growth rates.

**TABLE 3**  
**3SLS Estimation on Public Expenditure Impact**

Case A	Case B	Case C
Change of Log GDP Per Capita [D(GP)]	Change of Log Agriculture	Change of Log GDP Per Capita [D(GP)] &

	& Log Agriculture VA Per Capita [D(AGP)]			VA per Capita [D(AGP)]		Log Agriculture VA Per Capita [D(AGP)] – Asia Region		
	Total Sample			Asia Region		Asia Region		
	D(GP)	D(AGP)	D(TE)	D(AGP)	D(TE)	D(GP)	D(AGP)	D(TE)
D(TE)	<b>0.669</b>	<b>0.655</b>		<b>1.254</b>		<b>1.288</b>	<b>0.716</b>	
	<b>(3.01)***</b>	<b>(3.00)***</b>	-	<b>(2.19)**</b>	-	<b>(2.47)**</b>	<b>(3.90)***</b>	-
D(AGP)	<b>-0.32</b>		-	-	-	<b>-1.27</b>		-
	<b>(1.72)*</b>	-	-			<b>(2.84)***</b>	-	-
initial GP	0.026			-	-	0.161		
	(0.31)	-	-			(0.77)	-	-
initial AGP		<b>0.216</b>		-0.023			<b>-0.165</b>	
	-	<b>(2.32)**</b>	-	(0.14)	-	-	<b>(1.82)*</b>	-
Trade share	-0.055	<b>-0.073</b>		-0.141		-0.156	-0.097	
	(1.63)	<b>(1.73)*</b>	-	(0.96)	-	(1.48)	(1.60)	-
Land p.c.		-0.116		-0.04			0.027	
	-	(1.17)	-	(0.29)	-	-	(0.34)	-
Working ratio		-0.158		0.313			0.491	
	-	(0.32)	-	(0.39)	-	-	(0.91)	-
Working ratio*Land p.c.		-0.152		-0.046			0.024	
	-	(0.88)	-	(0.18)	-	-	(0.16)	-
Crisis*Asia	<b>-0.041</b>	0.001		-0.01		<b>-0.078</b>	-0.008	
	<b>(2.74)***</b>	(0.07)	-	(0.3)	-	<b>(2.16)**</b>	(0.34)	-
Lag D(TE)			<b>-0.11</b>		-0.107			<b>-0.195</b>
	-	-	<b>(2.11)**</b>	-	(1.02)	-	-	<b>(2.45)**</b>
Constant	-0.11	-1.134	0.293	0.451	0.293	-0.857	1.621	0.302
	(0.18)	(1.43)	(2.36)	(0.35)	(2.54)	(0.52)	(2.2)	(2.62)
Observations	117	117	117	64	64	64	64	64

Note: Absolute value of z statistics in parentheses. \* Significant at the 10%, \*\* significant at the 5%, and \*\*\* significant at the 1% level. Year and country dummies are included in the regression but not shown in the table.

**TABLE 4**

**3SLS Estimation of Impacts of Infrastructure and Non-Infrastructure Expenditure (Total Sample)**

	Case A			Case B			Case C			
	Change of Log GDP Per Capita [D(GP)]			Change of Log Agriculture VA Per Capita [D(AGP)]			Change of Log GDP Per Capita [D(GP)] & Log Agriculture VA Per Capita [D(AGP)] - Total Sample			
	D(GP)	D(INF)	D(NetINF)	D(AGP)	D(INF)	D(NetINF)	D(GP)	D(AGP)	D(INF)	D(NetINF)
D(INF)	<b>0.047</b> <b>(2.99)***</b>	-	-	<b>0.081</b> <b>(1.65)*</b>	-	-	0.031 (1.42)	<b>0.064</b> <b>(1.65)*</b>	-	-
D(NetINF)	<b>0.31</b> <b>(1.87)*</b>	-	-	<b>1.107</b> <b>(2.56)**</b>	-	-	0.033 (0.18)	<b>1.066</b> <b>(2.90)***</b>	-	-
D(AGP)	<b>0.134</b> <b>(1.68)*</b>	-	-	-	-	-	0.146 (0.76)	-	-	-
initial GP	0.034 (0.32)	-	-	-	-	-	0.057 (0.99)	-	-	-
initial AGP	-	-	-	<b>0.219</b> <b>(1.98)**</b>	-	-	-	<b>0.222</b> <b>(2.09)**</b>	-	-
Trade share	0.024 (0.63)	-	-	-0.049 (0.57)	-	-	-0.01 (0.25)	-0.059 (0.78)	-	-
Debt	<b>-0.04</b> <b>(2.02)**</b>	-	-	-	-	-	-	-	-	-
Land p.c.	-	-	-	-0.117 (0.93)	-	-	-	-0.098 (0.83)	-	-
Working ratio	-	-	-	-0.195 (0.31)	-	-	-	-0.151 (0.25)	-	-
Working ratio*Land p.c.	-	-	-	-0.065 (0.32)	-	-	-	-0.048 (0.24)	-	-
Crisis*Asia	<b>-0.032</b> <b>(1.72)*</b>	-	-	0.005 (0.21)	-	-	<b>-0.042</b> <b>(3.22)***</b>	0.005 (0.22)	-	-
Lag D(INF)	-	<b>-0.346</b> <b>(3.06)***</b>	-	-	<b>-0.253</b> <b>(2.93)***</b>	-	-	-	<b>-0.267</b> <b>(3.17)***</b>	-
Lag D(NetINF)	-	-	-0.131 (1.11)	-	-	-0.098 (1.44)	-	-	-	-0.101 (1.49)
Constant	-0.381 (0.47)	-0.899 (1.88)	0.655 (4.67)	-1.816 (1.93)	-0.96 (2.24)	0.632 (5.2)	-0.402 (0.94)	-1.756 (1.94)	-0.972 (2.27)	0.633 (5.21)
Observations	106	106	106	106	106	106	106	106	106	106

Note: Absolute value of z statistics in parentheses. \* Significant at the 10%, \*\* significant at the 5%, and \*\*\* significant at the 1% level. Year and country dummies are included in the regression but not shown in the table.

**TABLE 5**

**3SLS Estimation of Impacts of Infrastructure and Non-Infrastructure Expenditure (Asia Region)**

	Case A			Case B			Case C			
	Change of Log GDP Per Capita [D(GP)]			Change of Log Agriculture VA Per Capita [D(AGP)]			Change of Log GDP Per Capita [D(GP)] & Log Agriculture VA Per Capita [D(AGP)] - Total Sample			
	D(GP)	D(INF)	D(NetINF)	D(AGP)	D(INF)	D(NetINF)	D(GP)	D(AGP)	D(INF)	D(NetINF)
D(INF)	<b>0.087</b> <b>(1.87)*</b>	-	-	0.058 (0.93)	-	-	<b>0.074</b> <b>(1.98)**</b>	0.074 (1.38)	-	-
D(NetINF)	<b>0.465</b> <b>(2.75)***</b>	-	-	<b>0.846</b> <b>(4.87)***</b>	-	-	<b>0.511</b> <b>(3.39)***</b>	<b>0.627</b> <b>(4.86)***</b>	-	-
D(AGP)	-0.003 (0.02)	-	-	-	-	-	-0.427 (1.57)	-	-	-
initial GP	0.095 (1.06)	-	-	-	-	-	<b>0.147</b> <b>(1.84)*</b>	-	-	-
initial AGP	-	-	-	-0.049 (0.35)	-	-	-	-0.18 (1.52)	-	-
Trade share	-0.014 (0.30)	-	-	<b>-0.14</b> <b>(2.02)**</b>	-	-	-0.058 (1.19)	<b>-0.097</b> <b>(1.69)*</b>	-	-
Land p.c.	-	-	-	0.052 (0.43)	-	-	-	0.028 (0.27)	-	-
Working ratio	-	-	-	1.001 (1.41)	-	-	-	0.737 (1.17)	-	-
Working ratio*Land p.c.	-	-	-	0.12 (0.58)	-	-	-	0.042 (0.23)	-	-
Crisis*Sea	-0.048 (1.55)	-	-	0.011 (0.29)	-	-	<b>-0.054</b> <b>(2.10)**</b>	-0.003 (0.10)	-	-
Lag D(INF)	-	<b>-0.237</b> <b>(2.16)**</b>	-	-	<b>-0.237</b> <b>(2.16)**</b>	-	-	-	<b>-0.262</b> <b>(2.41)**</b>	-
Lag D(NetINF)	-	-	-0.129 (1.57)	-	-	-0.129 (1.57)	-	-	-	<b>-0.193</b> <b>(2.49)**</b>
Constant	-0.819 (1.21)	-0.807 (2.49)	0.556 (4.9)	0.908 (0.77)	-0.896 (2.78)	0.612 (5.48)	-1.082 (1.80)	1.703 (1.71)	-0.918 (2.85)	0.624 (5.59)
Observations	61	61	61	61	61	61	61	61	61	61

Note: Absolute value of z statistics in parentheses. \* Significant at the 10% , \*\* significant at the 5%, and \*\*\* significant at the 1% level. Year and country dummies are included in the regression but not shown in the table.

**TABLE 6**  
**Effect of Total Public Expenditure on Growth and Poverty**

<b>Asian sub-sample</b>		<b>No change</b>	<b>D(TE)</b>	
			<b>10%</b>	<b>20%</b>
<i>Overall growth</i>	(1) Reference Growth Rate (for the first column)	Reference rate <sup>*1</sup>	20.85% <sup>*2</sup>	41.14% <sup>*2</sup>
	(2) Percent decline in poverty ratio	-6.79	-8.26	-9.70
	(3) Actual/Predicted Poverty ratio	31.95	31.45	30.96
	(4) Difference in the number of the poor (base in no change)		10.30	20.44
<i>Agricultural growth</i>	(1) Reference Growth Rate (for the first column)	Reference rate <sup>*1</sup>	53.81% <sup>*2</sup>	107.14% <sup>*2</sup>
	(2) Percent decline in poverty ratio	-1.10	-1.71	-2.31
	(3) Actual/Predicted Poverty ratio	33.90	33.69	33.49
	(4) Difference in the number of the poor (base in no change)		4.25	8.50

Note: <sup>\*1</sup>. The reference growth rate is computed by the coefficient estimates reported earlier and mean values of explanatory variables.

<sup>\*2</sup>. Percentage increases in comparison with the reference growth rates (Gaiha et al. 2009).

**TABLE 7**  
**Effect of Disaggregated Public Expenditure on Growth and Poverty**

<b>Asian sub-sample</b>		<b>No change</b>	<b>D(INF)</b>		<b>D(NetINF)</b>	
			<b>10%</b>	<b>20%</b>	<b>10%</b>	<b>20%</b>
<i>Overall growth</i>	(1) Growth rate	Reference rate	5.39	5.42	5.89	6.41
	(2) Percent decline in poverty ratio	-6.72	-6.76	-6.79	-7.40	-8.08
	(3) Actual/Predicted Poverty ratio	31.98	31.96	31.95	31.74	31.51
	(4) Difference in the number of the poor (base in no change)		0.27	0.54	4.81	9.56
<i>Agricultural growth</i>	(1) Growth rate	Reference rate			3.18	4.05
	(2) Percent decline in poverty ratio	-1.21			-1.68	-2.15
	(3) Actual/Predicted Poverty ratio	33.87			33.70	33.54
	(4) Difference in the number of the poor (base in no change)				3.31	6.61

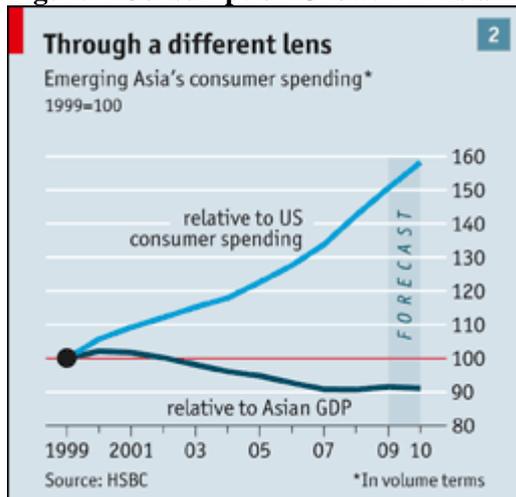
**TABLE 8**  
**Effect of Physical and Social Expenditure on Growth and Poverty**

<b>Aggregate sample - Overall growth</b>		<b>No change</b>	<b>D(INF)</b>	
			<b>10%</b>	<b>20%</b>
	(1) Reference Growth Rate (for the first column)	Reference rate <sup>*1</sup>	3.37% <sup>*2</sup>	6.73% <sup>*2</sup>
	(2) Percent decline in poverty ratio	-10.19	-10.54	-10.90
	(3) Predicted Poverty ratio	30.79	30.67	30.54
	(4) difference in the number of the poor (base in no change)		2.52	5.04
	(1) Reference Growth Rate (for the first column)	Reference rate <sup>*1</sup>	3.47% <sup>*2</sup>	6.95% <sup>*2</sup>
	(2) Percent decline in poverty ratio	-8.35	-8.65	-8.95
	(3) Predicted Poverty ratio	31.42	31.31	31.21
	(4) difference in the number of the poor (base in no change)		2.11	4.23

Note: <sup>\*1</sup>. The reference growth rate is computed by the coefficient estimates reported earlier and mean values of explanatory variables. The difference in reference growth rates in the two cases is mainly due to the difference in coefficient estimates and in means of explanatory variables, averaged in 2- year and 3- year spans.

<sup>\*2</sup>. Percentage increases in comparison with the reference growth rates (Gaiha et al. 2009).

**Figure 1 Consumption Growth in Asia**



Source: *The Economist* (June 25<sup>th</sup>, 2009)