

Food Security and Economic Growth: an Asian perspective

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Food security and economic growth interact in a mutually reinforcing process over the course of development. It is only in modern times that entire societies have achieved food security.¹ Earlier, only privileged members of society were able to escape from chronic hunger and the constant threat of famine (Fogel 1991). Many countries in the developing world, especially in Africa and South Asia, have not managed this escape. In these countries, understanding the factors that cause widespread hunger and vulnerability to famines, and the mechanisms available to alleviate their impact, remain important intellectual challenges (Ravallion 1987, 1997; Sen 1981; Dreze and Sen 1989).

There is a different way to pose the question, however. Rather than asking how to cope with hunger and famine, the question might be how to escape from their threat altogether. As Fogel (1991) has emphasised, this is a modern question that is only partly answered by the institutional and technological innovations that are at the heart of modern economic growth (Kuznets 1966). Without these innovations, the modern escape from hunger to food security would not have been possible. But the record of economic growth for the developing countries since the 1950s shows that, even in countries with relatively low levels of per capita income, government interventions to

enhance food security can lift the threat of hunger and famine. The countries most successful at this task are in East and Southeast Asia, although the experience in South Asia has been instructive as well (Timmer 2000).

Food security: conceptualising the issues

That rich countries have little to fear from hunger is a simple consequence of Engel's Law; consumers have a substantial buffer of non-food expenditures to rely on, even if food prices rise sharply. In a market economy, the rich do not starve. Wars, riots, hurricanes and floods, for example, can disrupt the smooth functioning of markets, and all in their wake can perish. But rich societies usually have the means to prevent or alleviate such catastrophes, social or natural. Food security in rich societies is simply part of a broader net of social securities.

Food security and public action

Without the buffer of Engel's Law, consumers in poor countries are exposed to continuing hunger and vulnerability to shocks that set off famines (Anderson and Roumasset 1996). And yet, several poor countries have taken public

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1 Defining food security is an exercise in itself, especially when both macro and micro dimensions are included in the definition. In an influential review, Simon Maxwell (1996) listed 32 different definitions of the term used by various authors between 1975 and 1991. Each definition is sensible in some context. The goal of this paper is to understand the causal mechanisms that establish two-way links between economic growth and food security. Almost any definition that is intuitively plausible will do for that purpose.

action to improve their food security. The typical approach reduces the numbers of the population facing daily hunger by raising the incomes of the poor, while simultaneously managing the food economy in ways that minimise the shocks that might trigger a famine. These countries, some of them quite poor, have managed the same 'escape from hunger' that Fogel documents for Europe during the 19th and early 20th centuries.

This article has a main premise: an early escape from hunger—achieving food security at the societal level—is not just the result of one-way causation from economic growth generated by private decisions in response to market forces. Improved food security stems directly from a set of government policies that integrates the food economy into a development strategy that seeks rapid economic growth with improved income distribution (Timmer, Falcon and Pearson 1983). With such policies, economic growth and food security are mutually reinforcing. Countries in East and Southeast Asia offer evidence that poor countries using this strategy can escape from hunger in two decades or less—that is, in the space of a single generation.

Although two decades may seem an eternity to the hungry and those vulnerable to famine, it is roughly the same as the time between the first World Food Summit Conference in 1974 and the second one in 1996. Despite much well-meaning rhetoric at the earlier summit, including Henry Kissinger's pledge that no child would go to bed hungry by 1985, the failure to place food security in a framework of rural-oriented economic growth, in combination with policies to stabilise domestic food economies, meant that those two decades were wasted in many countries. And despite the global community's pledge to reach the Millennium Development Goals by 2015, goals which place an end to hunger at the center of the objectives, there is still not widespread understanding that food security needs to be connected directly to economic growth strategies if these goals are to be achieved.

The focus here is on food security as an objective of national policy. At that level, policymakers have an opportunity to create the conditions under which households can gain

access to food on a reliable basis through self-motivated interactions between local markets and home resources. The perspective taken is, thus, primarily an economic one.

At first glance, food security strategies in Asia would seem to have been little influenced by economics. The dominance of rice in the diets of most Asians, coupled with the extreme price instability in the world market for rice, forced all Asian countries to buffer their domestic rice price from the world price. This clear violation of the border price paradigm, and the accompanying restrictions on openness to trade, seems to have escaped many advocates of the East Asian miracle, who saw the region's rapid growth as evidence in support of free trade (World Bank 1993). In addition, most Asian governments have paid little attention to formal efforts to define food security as a prelude to government interventions that would be seen as their approach to food security. The US position paper for the 1996 World Food Conference, for example, used one version of these standard definitions.

Food security exists when all people at all times have physical and economic access to sufficient food to meet their dietary needs for a productive and healthy life. Food security has three dimensions:

- Availability of sufficient quantities of food of appropriate quality, supplied through domestic production or imports;
- Access by households and individuals to adequate resources to acquire appropriate foods for a nutritious diet; and
- Utilisation of food through adequate diet, water, sanitation and health care (United States Department of Agriculture 1996:2).

This definition is obviously an ideal that no country could hope to reach. Instead of debating definitions, the food security strategies of most countries in East and Southeast Asia have had two basic components, neither of which is linked to any of the standard definitions of food security used by international agencies. By contrast, the Asian countries that have been most successful at providing food security to their citizens have based their strategies on two elements of their domestic food system over which they have some degree of

policy control: the sectoral composition of income growth, and food prices.

The strategic approach to food security

The rate and distribution of economic growth are primarily matters of macroeconomic and trade policy (once asset distributions are given as an initial condition). Although there is widespread controversy over the role Asian governments played in stimulating growth and channelling its distribution, there is no disagreement that high rates of savings and investment, coupled with high and sustained levels of capital productivity, in combination with massive investments in human capital, explain most of the rapid growth that occurred up to 1997 (World Bank 1993; Timmer 2004a). Growth that reached the poor—what is now termed ‘pro-poor growth’—was one component of the food security strategy.

In the second element of the strategy, Asian governments sought to stabilise food prices in general, and rice prices in particular. Engel’s Law ensures that success in generating rapid economic growth that includes the poor is the long-run solution to food security. In the language of Dreze and Sen (1989), such economic growth provides ‘growth-mediated security’. In the meantime, stabilisation of food prices in Asia ensured that short-run fluctuations and shocks did not make the poor even more vulnerable to inadequate food intake (Timmer 1991, 1996).

Most economists are highly dubious that such food price stability is financially feasible or economically desirable. It is not a key element of the ‘support-led security’ measures outlined by Dreze and Sen (1989). In a review of food security and the stochastic aspects of poverty, Anderson and Roumasset (1996) essentially dismiss efforts to stabilise food prices using government interventions:

Given the high costs of national price stabilisation schemes (Newbery and Stiglitz 1979, 1981; Behrman 1984; Williams and Wright 1991) and their effectiveness in stabilising prices in rural areas, alternative policies decreasing local price instability need to be considered. The most cost-effective method for increasing price stability probably is to remove

destabilising government distortions. Government efforts to nationalise grain markets and to regulate prices across both space and time have the effect of eliminating the private marketing and storage sector. Rather than replacing private marketing, government efforts should be aimed at enhancing private markets through improving transportation, enforcing standards and measures in grain transactions, and implementing small-scale storage technology (Anderson and Roumasset 1996:62).

Although this condemnation of national price stabilisation schemes might well be appropriate for much of the developing world, it badly misinterprets both the design and implementation of interventions to stabilise rice prices in East and Southeast Asia (Dawe 2001; Timmer 1991, 1993, 1996, 2003). For food security in this region, the stabilisation of domestic rice prices was in fact feasible in the context of an expanding role for an efficient private marketing sector. The resulting stability was not an impediment, but was actually conducive to economic growth. The stabilisation scheme and economic growth worked in tandem to achieve food security as quickly as possible.

The micro dimensions of food security

For the purposes of government policy, food security can be thought of as a continuous spectrum—from the micro perspective of nutritional well-being of individuals all the way to the macro perspective that assures regular supplies of food in national, regional and local markets. The challenge, and one important objective of food policy, is to create an environment where access to purchasing power, nutritional knowledge and health care within each individual household assures adequate demand for food in those markets, thus guaranteeing food security at both ends of the micro–macro spectrum. Creating food security at both the micro and macro levels is a complicated task in an open, market-oriented economy, but it is only this kind of economy that can generate rapid growth and reduction of poverty.

Both elements of the Asian strategic approach to food security—rapid economic growth

and food price stability—address the macro dimensions of food security, not the micro dimensions found at and within the household. Governments can do many things to improve food security at the household and individual level and most countries in Asia have programs to do so. Rural education accessible to females and the poor, family planning and child-care clinics in rural areas, nutrition education, and extension specialists helping to improve home gardens are just a few of the possibilities (Block et al. 2004). Most of the literature on food security deals with approaches at this level, but problems of definition, measurement, project design and management vastly complicate strategies that rely on direct household interventions (D.G. Maxwell 1996).

These complications, in turn, effectively limit the number of households that can be reached with a micro approach. Without dismissing the potential effectiveness of these approaches to enhancing food security in particular circumstances, it is still important to realise the scale of the problem. Hundreds of millions of people in Asia still do not have food security. Programs delivering food directly to households cannot bring it in a sustainable fashion. Only food security at the macro level can provide the appropriate facilitative environment for households to ensure their own food security.

Growth, poverty and stability

The close historical connection seen in much of East and Southeast Asia between improvements in food security and reduction of poverty has been a result of government efforts to link market-led economic growth to interventions that improve food security at both the household and national levels. This strategic connection is not an accident. A coherently designed macro food policy couples a strategy for food security with a strategy for growth that reaches the poor. Establishing this link to food security from the macro side allows a country to capture growth opportunities, some quite subtle, that are missed otherwise. Such a macro food policy has three components that,

in turn, reinforce the country's food security: rapid growth in the macro economy, poverty reduction through rural economic growth, and stability of the food system. Agriculture and a dynamic rural economy are the keys to integrating all three components (see Figure 1).

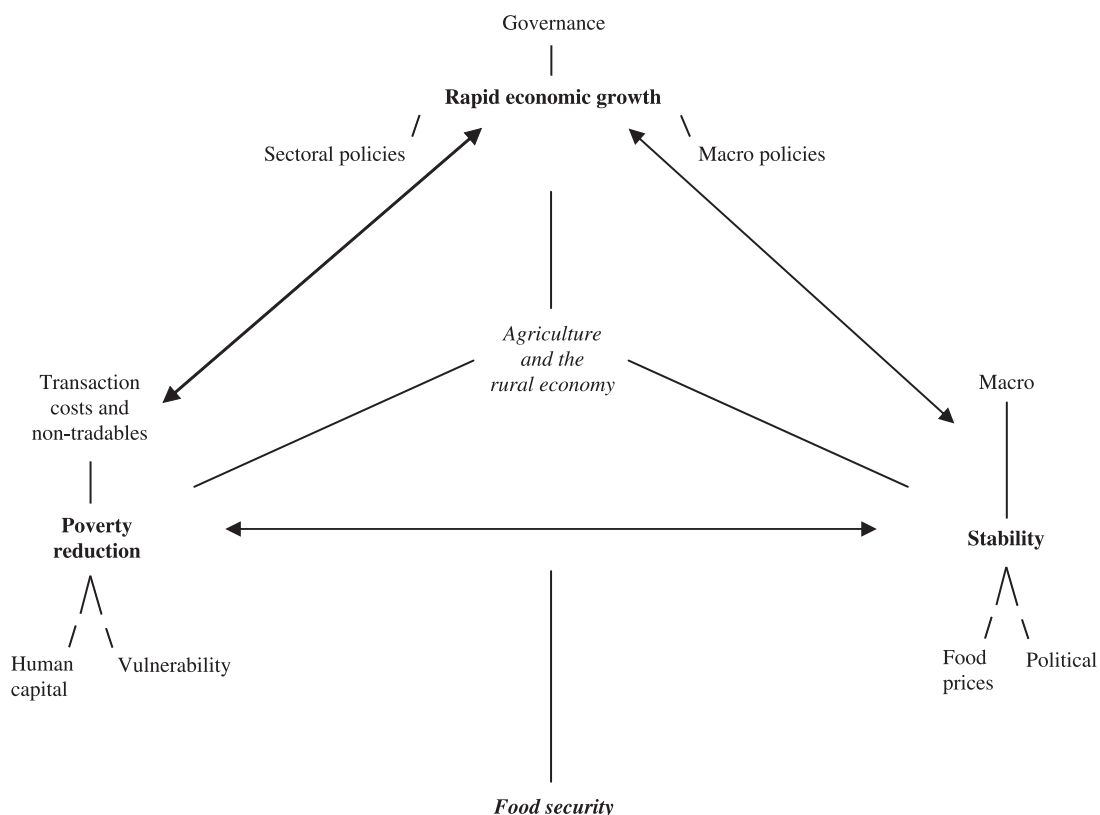
This macro perspective on the food economy helps integrate a country's food security at the household level with national food markets. In turn, food security at both levels enhances the prospects for rapid economic growth, poverty reduction and broad-based participation by citizens in higher living standards. The complexity for food policy arises because the achievement of each of the goals pictured in Figure 1 depends on the simultaneous pursuit of the other two strategies, which interact through market and behavioural mechanisms. For example, rapid growth in the macroeconomy must be designed to reach the poor. Otherwise, poverty reduction is delayed. Likewise, more direct interventions to reach the poor, such as a targeted rice distribution program, cannot be sustained. Similarly, raising poor households above the poverty line does not guarantee their food security if food supplies disappear from markets or prices rise beyond their means.

The primary role of economic growth

Rapid economic growth has been the main vehicle by which most Asian countries have reduced poverty and enhanced food security (World Bank 1993). The region has seen substantial variance in growth rates since the 1960s, with China growing extremely rapidly after 1980 and the Philippines growing only modestly since 1961 (see Figure 2).

Most countries have averaged growth rates in per capita incomes of between 3 and 4 per cent per year, rates that double living standards every two decades or so. When such growth reaches the poor (that is, if income distribution does not deteriorate significantly during the growth process), poverty rates can fall from over one-half the population—the poverty incidence in extremely poor countries—to less than one-eighth of the population in just one generation.

Figure 1
A macro perspective on the determinants of food security: three ‘spheres’ of activity, held together by agriculture and the rural economy



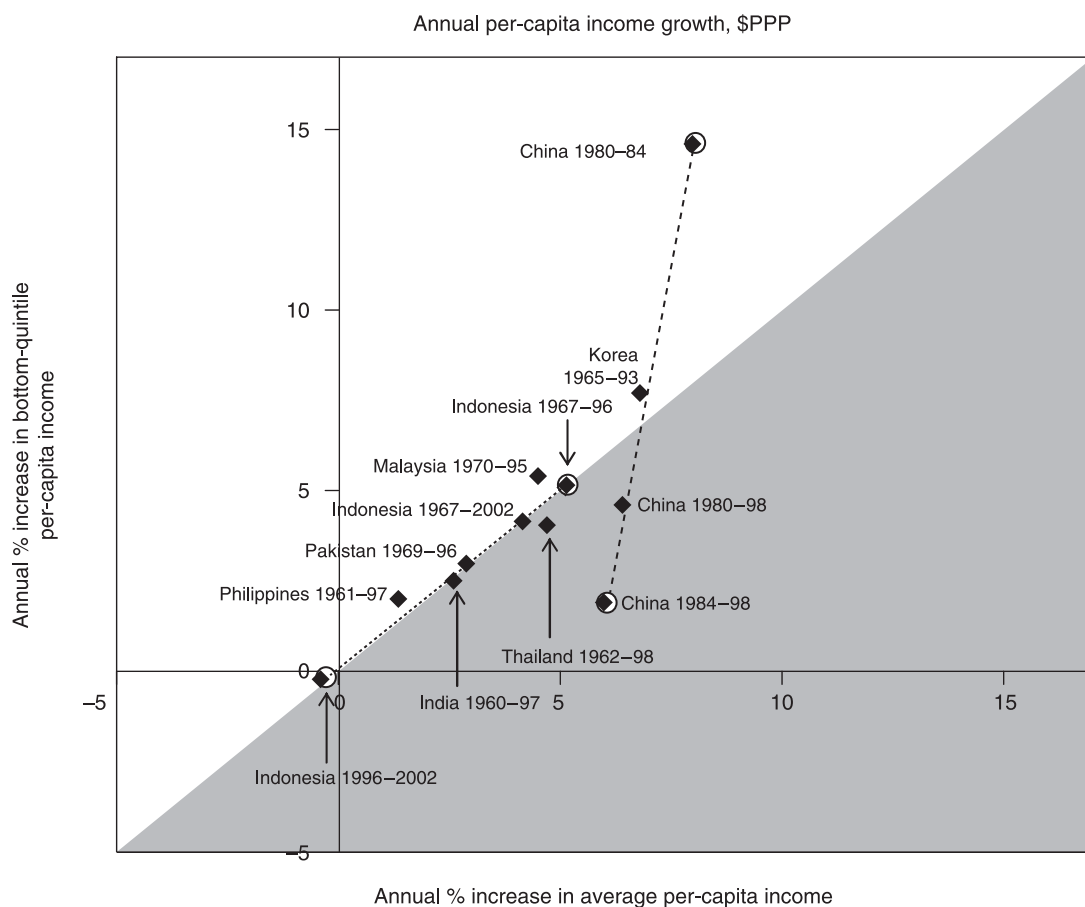
Reaching the poor

Such rates of decline in poverty rates were achieved in Indonesia, China and Vietnam after the 1970s, and earlier in Thailand, Malaysia and Northeast Asia. Income distribution tended to be stable, or even improve somewhat, during periods of extremely rapid growth in average incomes per capita (Timmer 2004a). In addition to the average growth experience for eight Asian countries since the 1960s, Figure 2 also shows that the share of that income earned by the bottom 20 per cent of the income distribution (a rough proxy for the poor in most of these countries) tended to be remarkably stable. Most growth experiences lie close to

the 45 degree line, where incomes of the poor grow at the same rate as for the rest of the economy.

Despite this long-run stability in income distribution, there is considerable variance in how well the poor connect to economic growth during shorter episodes (Timmer 1997, 2004a). This variance tends to be explained by initial conditions—especially land distribution—and by the sector of economic growth. At least in most of Asia, agricultural growth has tended to be much more pro-poor than growth in the modern industrial or service sectors. Finally, rice prices are influential in explaining changes in income distribution. Sharply rising rice prices are bad for the poor.

Figure 2
Income growth for the bottom quintile plotted against growth for average per capita incomes, for eight countries in Asia



Source: Timmer, C.P. 2004a. 'The road to pro-poor growth: Indonesia's experience in regional perspective', *Bulletin of Indonesian Economic Studies*, 40(2):177-207.

Stabilising food prices

All government leaders recognise the impact of rice prices on the poor, and most countries stabilised their rice economy by keeping domestic rice prices more stable than border prices. Economic growth, poverty reduction, and stability are linked to each other through the 'virtuous circles' reviewed by Birdsall et al. (1995). Greater stability of the food economy contributes to faster economic growth by reducing signal extraction problems, lengthening

the investment horizon and reducing political instability (Timmer 1989; Ramey and Ramey 1995; Dawe 1996). In the other direction, stability contributes to equity and poverty reduction by reducing the vulnerability of the poor to sudden shocks in food prices or availability. Greater equity also stimulates investment in human capital, especially in rural areas (Williamson 1993; Birdsall et al. 1995), thus speeding up economic growth, at least in the long run.

From 1970 to 1995, Indonesia managed this stabilisation process while not deviating far

from the long-run trend of prices in the world market (Timmer 1996). More developed countries in the region, from Japan to Malaysia, kept their rice prices stable at levels that became progressively higher in relation to the price of rice in world markets. Much of this divergence, however, was not due to a conscious policy of raising the real price of rice domestically, but because the world price of rice has declined almost continuously since the mid-1970s. Most of these economies' currencies were also appreciating relative to the US dollar, the currency in which world rice prices are quoted.

By implementing a simple policy objective of stabilising the real domestic price of rice—the operational definition of food security in these societies—most Asian countries saw the level of protection of their rice farmers rise sharply from the 1970s to the mid-1990s (Timmer 1993). Pro-poor economic growth and stable rice prices were the recipe for food security in Asia. High levels of agricultural protection, and the failure to diversify and modernise their agricultural sectors, were largely unanticipated side effects of the strategy of growth with stability. Efforts to reduce the high levels of agricultural protection, especially for rice farmers, by directly confronting the political forces defending this 'Asian' approach to food security have been repeatedly rebuffed since the 1980s.

Agriculture and the rural economy

For the large countries of Asia, investments since the 1960s to raise the productivity of domestic rice producers brought greater stability to the rice economy at the macro level, mostly because reliance on the world market had been destabilising in relation to domestic production. Expanded rice production and greater purchasing power in rural areas, stimulated by the profitable rice economy, improved the level and stability of food intake of rural

households. The dynamic rural economy helped to reduce poverty quickly by inducing higher real wages. The combination of government investments in rural areas, stable prices at incentive levels, and higher wages helped reduce the substantial degree of urban bias found in most development strategies (Lipton 1977, 1993). Growth in agricultural productivity has been seen also to stimulate more rapid economic growth in the rest of the economy.²

Rural economic growth

The agricultural revolution that swept through East and Southeast Asia after the 1960s dramatically improved the living standards of most people, despite the setbacks from the East Asian financial crisis in 1997. By the 1990s, far fewer people were trapped in poverty than in the mid 1960s, food security had been enhanced by surpluses available in an expanded Asian rice market, economies had become highly diversified as the manufacturing sector had outgrown the agricultural sector, and export-oriented companies became competitive in international markets.

The historical and comparative lessons from Asia are clear. They show conclusively that growth of the rural economy has helped the poor more than growth in the urban industrial sector and that such growth has also contributed to more rapid growth in the overall economy (Huppi and Ravallion 1991; Ravallion and Datt 1996; Ravallion and Chen 2004; Sumarto and Suryahadi 2003; Fan, Thorat and Rao 2004; Timmer 1997, 2004b). From the point of view of food security, changes in opportunities for productivity growth in the rural economy influence the stability of the food economy and the possible need for food subsidies targeted directly to the poor, as opposed to incorporating these families into a rapidly growing economy.

These are difficult issues. Designing and coordinating relationships among sectors so

2 An entire body of literature exists that analyses the role of agriculture in economic growth (Johnston and Mellor 1961; Eicher and Staatz 1998; Timmer 1992, 1995, 2002, 2004b). Specific linkages that have been identified in this literature work through the capital and labour markets, as analysed by Lewis (1955); through product markets, as specified by Johnston and Mellor (1961); and through a variety of non-market connections that involve market failures and endogenous growth mechanisms (Timmer 1995, 2002, 2004b).

that the growth process is rapid, equitable, and sustainable has become a complicated process. The complexity is especially clear in the example of food security, which requires an integration of macroeconomic policies that affect the speed of economic growth, sectoral policies and institutional changes that affect the distribution of that growth, and implementation of food distribution and stabilisation schemes that guarantee continued access to food by the poor.

Agricultural productivity

Improvements in agricultural productivity that have been stimulated by government investment in rural infrastructure, agricultural research and extension, irrigation, and appropriate price incentives have contributed directly to economic growth, poverty reduction and stability (Timmer 1992, 1995, 2004b). Throughout Asia, however, rice is no longer the engine of growth in most rural areas. The difficult task has been to conduct research, on a country-specific basis, to discover ways to raise productivity in agriculture per hectare and per worker, to sustain that productivity, and to maintain adequate incentives to ensure continued investment in the sector.

Encompassing all three issues is the need to manage a smooth structural transition by ensuring that the productivity of the rural labour force and its per capita income keep pace with productivity and per capita income in the urban sector. It is no coincidence that all of these issues revolve around productivity. Higher productivity is the only way to achieve and sustain higher living standards in the long run. Income transfers, whether through price policy or direct government subsidies, do not build the economic foundation to support broad-based increases in welfare. Food policy thus must stimulate increases in productivity in the rural economy. Concern for the short-run food intake of the poor, and their nutritional well-being, is also important. But the vehicles that will solve the problem of poverty all involve higher productivity of resource use in the economy (Lipton 2004).

After the significant gains from the first 'Green Revolution' of the 1960s, Asia has had

a particularly difficult task in raising agricultural productivity. Since 1990, rice yields on the International Rice Research Institute's (IRRI's) best experimental plots have stagnated, and there has been only limited evidence of gains in other crops or in the livestock sector. The sources of growth for the higher yields that could form the basis of a second 'Green Revolution' have not been identified. Fertiliser and labour have been used very intensively. New biological technologies and improved management of all inputs at the farm level will be needed for the next round of productivity gains.

Both the technologies and the management techniques have had to be fine-tuned to local environments—a process that already has put great stress on central research centres to develop locally appropriate varieties and cultivation practices from the basic scientific breakthroughs that have been promised by IRRI and other centers in the Consultative Group on International Agricultural Research (CGIAR) system. In the first instance, this need for technologies to fit local environments has fitted nicely with the efforts by many governments to decentralise political decision-making and resource management. But the human and scientific resources to implement such an effort have been grossly inadequate, and it will take time to build the local institutions that can carry out these tasks (von Luebke 2004).

Almost every component of the gains in agricultural productivity since the 1960s has raised concerns about their sustainability. It is possible that soil fertility has been declining. The conversion of fertiliser into useful output has become less efficient. There is less biodiversity. Long-run problems are emerging in managing pests, weeds and diseases in highly productive ecosystems. There has been increased instability of weather and rainfall patterns—which is possibly a function of global climate change.

Despite these emerging problems of sustainability, the real prices of agricultural commodities in world markets have declined to very low levels in historical terms, and this decline has reduced incentives to fund research that raises agricultural productivity and its

sustainability. It has been difficult to justify investments whose payoff has been increased production of exactly these low-value commodities. The real price of rice in world markets has dropped from US\$1,000 per metric ton to US\$200 per metric ton since 1975. Many other agricultural commodity prices have followed a similar trend (World Bank 2004; Dawe 2004). Since average farm size has decreased in most countries in Asia because of population growth, finding a technology package and farm-gate price that could raise farm household incomes above the poverty line has become more than four times harder than in the mid 1970s. Agricultural policies in OECD countries have made both tasks even harder (Lipton 2004).

The rural economy and food security

One important outcome of a rural-oriented growth strategy is the achievement of food security. Political pressure to achieve this goal is one of the main driving forces behind the strategy itself. From this political perspective, food security is achieved when economic growth has raised the poor above a meaningful poverty line and when stabilisation of the food economy prevents exogenous shocks from threatening their food intake. In this approach, food security is sustained by the productivity of the poor themselves, but this security depends on public action to maintain a stable macro environment, including the food economy.

Once this process of rapid growth is under way, political tensions inevitably emerge from a structural transformation that takes place too rapidly for resources to move smoothly from the rural to the urban sector (Anderson and Hayami 1986; Timmer 1993, 2002). The entire society is less prone to these tensions if the gap between rural and urban incomes does not widen too much. All successfully growing countries have had to find ways to keep this gap from widening so much that it destabilises the political economy and jeopardises continued investment. Managing the transition from 'getting agriculture moving' to 'manufactured export-led growth' has been a very difficult

process throughout Asia, partly because of the very speed of the transition.

Rural–urban relationships during the structural transformation

Integrating the three components of the strategy for food security—rapid growth in the macro economy, poverty reduction through rural economic growth, and stability of the food system—is greatly complicated by the changing relationship between the rural and urban economies during the process of industrialisation. In all successful economies, incomes earned from farming tend to lag behind those earned in other occupations. Rural labour productivity can increase in two ways: directly in agricultural activities, through the application of new technologies, and indirectly, as workers shift from agriculture to manufacturing or the modern service sector. Both processes are part of the structural transformation, but the productivity of urban workers tends to run ahead of rural productivity, causing a pronounced structural lag (Anderson and Hayami 1986; Timmer 1988a, 2001, 2002). In most of Asia, from China to Indonesia to India, there has been a growing spread between the wages earned by unskilled agricultural workers and new entrants into labour-intensive manufacturing sectors, such as garments and electronics. At the same time, rice growing has been kept profitable through subsidies, virtually free irrigation water, price support and stabilisation programs, and a well-developed rural infrastructure that ensured low marketing margins for rice. Investments in rural education and health helped build human capital, but accumulation of other assets by farmers has been limited.

Managing food policy during the structural transformation

The challenge throughout Asia is to modernise agriculture, reduce its heavy dependence on rice through diversification, integrate the entire rural economy more fully into the industrial sector, especially through increases in processing

activities, and still keep rural incomes high enough to avoid rapid migration of workers to cities. This challenge is not unique to Asia. It is the heart of the tension generated by all successful structural transformations. But the political pressures to resolve the tension can quickly distort policymaking and cause massive budget losses, burdens on consumers, and conflicts with trading partners. In particular, efforts to reduce the incomes of rice farmers by bringing domestic prices closer to world prices are seen as worsening the situation, not helping it. A food policy that helps smooth the transition from a poor and rural economy to a rich and urban economy would pay very high dividends, but it must be formulated with a clear understanding of why the structural lag exists and its political link to food security.

Managing policy during the structural transformation thus becomes the organising framework for food policy analysis. The advantage of this perspective is the need to keep long-run objectives and economic forces in focus, at the same time that short-run crises receive urgent attention. For example, even as governments in the region attempt to cope with the problem for rice farmers of low prices in world markets, the structural transformation has reduced the significance of rice to national economies, to consumers, and even to rural incomes. Throughout Asia, most rice-producing families now earn more income from non-rice sources, including non-farm sources, than they do from producing and selling rice. Growing rice is a source of income that is competitive with non-farm wages for only a small share of rural households, and the proportion will continue to fall. If efforts to raise rice farmers' incomes are not consistent with these longer-run forces, the efforts will at best be expensive palliatives that slow down the movement of resources to more highly paid alternatives.

The political economy of agricultural protection

It is a sign of great progress that policymakers throughout Asia now worry more about

keeping rice prices high than keeping them low. Historically, in those societies in which poverty has remained untouched or even deepened, the agricultural sector has been seriously undervalued by both the public and private sectors. In addition to an urban bias in most domestic policies, the root cause of this undervaluation was a set of market failures. Commodity prices, by not valuing reduced hunger or progress against poverty, failed to send signals with appropriate incentives to decision-makers. These inappropriate signals tend to cause several problems.

First, low values for agricultural commodities in the marketplace are reflected in low political commitments (Bates 1981). But political commitments to rural growth are needed to generate a more balanced economy (Lipton 1977; Timmer 1993). The developing world has already seen a notable reduction in the macro-economic biases against agriculture, such as overvalued currencies, repression of financial systems, and exploitive terms of trade (Westphal and Robinson 2002). Further progress might be expected as democracy spreads and empowers the rural population in poor countries (although agricultural policies in most democracies make economists cringe, a point discussed shortly).

The second problem with low valuation of agricultural commodities is that rural labour is also undervalued. This weakens the link between urban and rural labour markets, which is often manifested in the form of seasonal migration and remittances. There is no hope of reducing rural poverty unless real wages for rural workers rise. Rising wages have a demand and a supply dimension, and migration can affect both in ways that support higher living standards in both parts of the economy. Migration of workers from rural to urban areas raises other issues, of course, but those issues depend fundamentally on whether this migration is driven by the push of rural poverty or the pull of urban jobs (Larson and Mundlak 1997). Whatever the cause, the implications for food security are clear: a greater share of food consumption will be sourced from urban markets. Whether these urban markets are supplied by domestic farmers or international trade is one of the key food

security debates under way in most Asian countries.

So far, the typical response has been for both of these problems to be addressed by trade and subsidy policies that increasingly protect farmers from foreign competition, especially rice farmers. How does urban bias turn so quickly to agricultural protection? The question has fascinated political scientists and economists for some time. Building on Krueger's (1974) and Olsen's (1965) theories of rent-seeking and collective action, Anderson and Hayami (1986) attempted to explain the rapid rise of agricultural protection in Asia in terms of the changing role of agriculture in the structural transformation and the costs of free-riding in political coalitions. A broader effort by Lindert (1991) followed the same approach, which is now formalised as 'positive political economy'. Actors in both economic and political spheres make rational (personal) choices with respect to policies, using political action, lobbying, and even bribery as mechanisms of influence.

These 'rational choice' models of agricultural protection, while illuminating, are not entirely satisfactory. An alternative model that builds on Asian societies' deep desire for food security, manifested as stable rice prices, does a much better job of explaining changes in the nominal degree of protection of rice farmers in Asia (Timmer 1988b, 1993). It is this deep-seated desire for food security that explains the rapid flip from urban bias to high protection. Newly well-off urban workers no longer need cheap rice in order to survive, but they still must buy all of their rice in local markets. They want to be certain it is available. For societies deeply distrustful of the world market as a source of reliable supplies—perhaps understandable in view of the thinness of the market historically, it is a very short step to protecting their own rice farmers as the surest vehicle to ensure the availability of rice.

Compounding the problem have been significant regional disparities in the speed of agricultural change in most of the larger countries in Asia. China, India and Indonesia, for example, all have lagging regions where modern seed-fertiliser technologies have not been

available or adopted, mostly because of persistent drought and poor irrigation prospects. These countries face both problems of agricultural development simultaneously: 'getting agriculture moving' in the backward regions, and diversifying out of intensive rice cultivation, while lowering protection levels on rice, in the advanced regions. It is likely that maize rather than rice will be the most efficient cereal crop for the drier, hillier, and more remote regions (Falcon forthcoming).

Managing a more efficient transition

Efficient paths to providing food security that are politically feasible have been hard to find. Any such path will involve greater diversification of agricultural production and consumption, including a greater role for international trade, continued commercialisation and market orientation, and a balance between the roles of the public and private sectors. At the core will be the welfare of farm households as they struggle with these issues. Mechanisms to enhance asset accumulation, including land consolidation and larger farm enterprises, will be needed for at least some of these households to remain competitive as agricultural producers. Others will exit agriculture. More effective rural credit systems will help this process, but institutional changes in land tenure are also likely to be needed, even if these are mostly in the form of long-term rental arrangements.

Human capital and technology

A key role of the government in developing a dynamic rural economy is the creation of human capital through the provision of education and the improvement of health care. These investments improve the welfare of rural citizens directly through improved life expectancy and a better quality of life. Indirectly, they are keys to increasing productivity. Only workers who are knowledgeable and healthy can participate effectively in the development process and choose how best to contribute productively to society, including exiting rural areas altogether by migrating to urban jobs.

Education and health care in rural areas are particularly important because the incidence of poverty is higher in rural areas than in urban areas. Furthermore, research has shown that rural education has more beneficial effects on the growth process than does education in urban areas (Timmer 2002). Rural health care is also important because rural labour is physically demanding.

Technology is an obvious means of increasing productivity in rural areas. Provided the government does not force farmers to use them, new technologies also give farmers and producers a wider range of choices. In rural industry, trade, and services, much of this new technology comes from the private sector, and the primary role of the government is to avoid impeding this process with unnecessary rules and regulations. Even in agriculture, often the best thing the government can do is to remove obstacles to dissemination of private-sector research, as with hybrid corn seed.

In many countries, public-sector agricultural research has made important contributions to productivity growth, with rates of return on investment often much greater than the social opportunity cost of capital. Malaysia's agricultural research system has made tremendous progress in oil palm and rubber, among other crops. In Indonesia, the agricultural research system has created many rice varieties that are planted by farmers throughout the country. Even before the monetary crisis in 1997, rice pesticide sales declined during the 1990s due to the efforts to develop integrated pest management strategies. Yet many challenges remain. Since 1990, rice yields have been virtually stagnant at the major rice research centers. Research institutions need support to make Asian agriculture internationally competitive and allow it to contribute to improved rural, as well as urban, welfare.

Markets and infrastructure

In a market economy, macroeconomic stability is essential to long-term poverty reduction in rural areas that are far from the offices of central governments in capital cities, where macro policy is determined. Sustained increases in

labour productivity require the accumulation of more physical and human capital per worker. Without a stable real exchange rate and a low rate of inflation, these investments will not be forthcoming, and there will be inadequate job creation in urban and rural areas to absorb a growing labour force with aspirations for a better life. A stable macroeconomic environment is essential for the creation of more job opportunities that mean more choices for rural citizens—farmers, traders, and workers in small and medium-size enterprises. This increased range of employment choices is the foundation of a dynamic rural economy.

Once macro stability is assured, the provision of infrastructure widens choices for rural dwellers, including the poor. Better roads allow the landless access to a wider range of employment and higher wages through opportunities for migration. Roads offer farmers a greater choice of locations in which to market their produce. A study of a group of 45 farmers in a Philippine village well-served by infrastructure found that they sold their output to 37 different traders. Such competition makes it far less likely that traders will be able to take advantage of farmers. Roads also give a private firm more freedom to choose its location, allowing the decentralisation of industry away from urban areas and providing rural inhabitants with more job choice in rural areas without the need to resort to migration. Rural electrification provides rural citizens access to more information that allows them to participate in the modern economy. In general, physical infrastructure, such as roads, ports, and communication networks, causes production and marketing systems to become more integrated and function more effectively, providing the base upon which an efficient rural economy can be built. Thailand has a dynamic rural economy that can compete in a wide range of international markets partly because of its dense road network, which connects agricultural production areas with consumption centres and export markets.

Marketing systems need to be predominantly or completely in the hands of the private sector, because only private marketing agents have the necessary detailed knowledge

of producers and consumers. Nevertheless, there is a strong role for government in providing the infrastructure that allows the private sector to perform its services efficiently. While the private sector should not be prevented from building infrastructure, it cannot be relied upon exclusively to perform this task because it typically does not have the ability to capture all the returns from such investments. Thus, it is incumbent upon the government to undertake these investments in public goods.

In addition to integrated markets for commodities and inputs, such as fertiliser, efficient and well-functioning rural credit markets are also important if farmers are to be able to reduce the impact of risk and have an effective instrument for asset accumulation. The most important role that government can play in integrating rural credit markets is to ensure macroeconomic stability, which reduces risk and uncertainty and thereby lowers costs in the financial system. Regulations can encourage the formation of rural branch banks, but requiring them is usually counterproductive.

Creation of a dynamic rural economy can occur only in a market-driven environment. Government plays a crucial role in fostering growth, but government cannot be the main engine of productivity growth in rural areas. This lesson has been learned many times over, often at great cost. The rural economies of the former Soviet Union and Eastern Europe were grossly inefficient and did not serve to improve the living standards of their people. Government monopolies in trade in agricultural products inevitably harm farmers' interests, as is clearly shown by the experience with commodity boards in Latin America and Africa. In Indonesia and the Philippines, local and national monopolies enjoyed by special interest groups (either inside or outside government) produced the same result—less choice and lower living standards for farmers.

Fortunately, there are many positive results as well. Productivity growth in agriculture surged when China abandoned its control of the rural economy in 1978. After Vietnam introduced market-oriented reforms in agriculture in 1989, productivity growth accelerated so quickly that Vietnam moved from being a

rice importer to the world's second-leading rice exporter.

Recent history has shown conclusively that a network of well-functioning markets is the only mechanism that allows rural citizens to realise their full potential as productive members of society. Governments cannot directly make farmers productive because agriculture is exceedingly complex, heterogeneous, and risky. Farmers operate in a constantly changing physical and economic environment that requires a wealth of micro-level information for efficient decision-making. The amount of information required makes it impossible for government bureaucrats to design sensible micro-level interventions. Farmers must be free to make these choices, both on grounds of economic efficiency and because freedom itself is an important component of human welfare.

The role of government

The new emphasis in development economics on governance as a key factor affecting the rate and distribution of economic growth brings the opportunity to link powerful political forces, such as the deep desire on the part of both urban and rural populations for food security, to the growth process itself. The obvious link is through policy analysis, where the analysis systematically utilises 'neoclassical political economy,' to use Srinivasan's (1985) nomenclature. Understanding the role of markets and the state, and their mutual interaction, will be key.

Within a framework where economic decision-makers are free to make choices based on their own knowledge and conditions, the role of government remains critical. In particular, government investments that allow markets to function efficiently are essential for fostering a dynamic rural economy, especially in agriculture. But the government role also spans a wide range of other activities, from macroeconomic policy at the national level to providing immunisation to poor children in remote areas. The key areas where government must provide support to the rural economy are growth-oriented economic policies and

macroeconomic stability, the generation of new technologies, facilities for the creation of human capital, and the provision of infrastructure to lower transactions costs. All are essential components of a dynamic rural economy. Large gains in agricultural productivity come from such public investments, which create new wealth for all members of society to share. Gains in productivity do not come from changes in price policy (for example, tariffs), which merely shift income from one group in society to another. From society's point of view, income transfers do not contribute to gains in productivity. The efficient provision of public goods, however, does stimulate such gains.

An Asian perspective on food security

Rice is different, and the difference has powerfully influenced economics and politics throughout much of Asia. The difference is manifested in three ways. First, rice is the dominant food staple throughout the region, often accounting for more than half of normal food energy intake. Daily access to rice is essential for survival. Second, rice is grown predominately by small holders who have been adept at adopting new technologies when market signals were favourable. In many countries, rice farmers are the single largest identifiable voting group. Third, international rice markets have been historically thin and unstable, causing all Asian countries to buffer their own farmers and consumers from fluctuating world prices (and thus making the fluctuations worse in an even thinner market). This buffering requires that governments control the flow of rice across their borders.

These characteristics of rice-based food systems forge a strong link between politics and economics, a link that policymakers, elected or not, see as a public mandate to deliver food security. Without understanding this link, it is impossible to understand Asia's record of economic growth—driven historically by dynamic rural economies—and the subsequent, seemingly inevitable, rise of agricultural protection. Although some of the forces driving this

protection are similar to those in Europe and the United States, the speed, level and early onset are unique to Asia.

The way forward is to make rice less different to consumers, farmers and in world markets, by making it more of an economic commodity and less of a political commodity. As noted above, much progress has actually been made in this direction since the 1980s, but that progress has not been clearly recognised or incorporated into new, politically viable strategies for food security in Asia. Still, the ingredients of such a strategy are clear: greater investment in rural human capital, to improve labour productivity and mobility; more efficient rural financial markets, to facilitate farm consolidation and even rural exit; and coordinated international efforts to open the world rice market to freer trade in order to deepen and stabilise price formation. This is a big agenda, to be sure, but implementing it—even gradually—will ensure a more prosperous and equitable future for Asia's farmers and greater food security for its consumers.

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sets or staring at regression results on a computer screen. Institutions and geography matter deeply in this understanding, and it comes only with extensive time *in situ*. And, beyond their patience, I owe many thanks to the family for significant substantive input into my thinking and writing. Dinner conversations at the Timmer family table were often *about* rice while we were *consuming* rice. Finally, this draft is as much the product of Carol's editing skills as it is my substantive knowledge. As always, I owe her my deep gratitude for this otherwise thankless effort, especially since she came out of retirement to do it.

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