CHAPTER 14

Distributional Consequences and Policy Responses to Food Price Inflation in Developing Asia

SHIKHA JHA AND CHANGYONG RHEE

INTRODUCTION

Rapidly rising food prices are not just a macroeconomic problem. By directly influencing poverty levels, they create a political challenge for developing countries. As the poor spend large fractions of their income on food, recent surges in food prices have pushed more people into poverty. According to the Asian Development Bank (ADB) estimates based on a $1.25 per day poverty line, a 10 percent increase in domestic food prices would increase the number of poor in developing Asia by more than 60 million and, further on, close to 200 million if the prices were to shoot up by 30 percent (ADB, 2011a). High prices thus weaken poverty reduction and exacerbate income inequality. In this chapter, we assess the economic impacts of evolving global food price movements on Asia and explore alternative domestic and regional policy tools to deal with the issue in light of structural impediments faced by the region.

Movements in global food prices over the last half a century can be roughly divided into three subperiods: the stable years from 1960 to 1972, the volatile years with a somewhat flat trend from 1973 to 2001, and the upward-drifting years with rising volatility from 2002 onward (Figure 14.1). After more than two decades of staying below trend, food prices surged in 2007–08, driven by structural and cyclical factors, demand and supply conditions, the ensuing financial market turbulence, and the links between food and energy markets (ADB, 2008). The food price index in 2007 and 2008 was 26 percent and 68 percent higher, respectively, than the index in 2006 due to a shortfall of production relative to

The views expressed in this chapter are those of the authors and do not necessarily reflect the views and policies of the Asian Development Bank, its Board of Governors, or the governments they represent. The authors are grateful to Rabah Arezki for valuable comments. This chapter draws heavily on previous ADB research.

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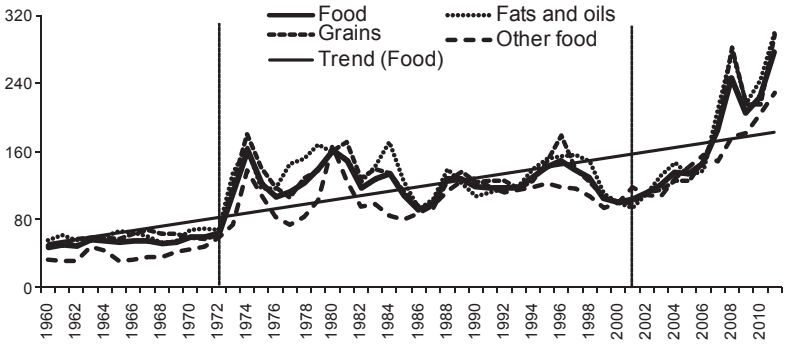

Figure 14.1 Structural Shifts in Food Price Indices, 1960–2010 (*2000 = 100*)

Source: World Bank Commodity Price Data.

Note: Data for 2011 are the average of January to November 2011. Vertical lines show beginnings of commodity booms.

consumption. As demand continued rising but supply could not keep pace, grain inventories were depleted rapidly. When the markets returned to balance in the aftermath of the financial crisis, the prices began to drop back toward trend late in 2008, but after declining briefly until 2009, they started climbing again from mid-2010 due to supply disruptions caused by adverse weather conditions. The combined stocks of rice, wheat, and corn, after declining by the end of 2006 to below 60 percent of the maximum observed in 1999, recovered to only a little over 70 percent by the end of 2010. In particular, the upward movement of corn and wheat prices continued until the second quarter of 2011 before retreating in July due to better supply conditions arising from improved weather.

Food price increases in recent years have become more persistent than in the past. Not only have these increases been widespread, but their synchronized movements with other commodities, especially energy, have been particularly noticeable (see Figure 14.2 and Ghoshray [2011]). Energy feeds into agricultural prices via the cost of energy-intensive inputs (such as nitrogen-based fertilizers made from natural gas, diesel used for irrigation pumps and transport, and power) and through diversion of food crops as input for production of competing products (corn and sugar are used to produce biofuels, and soybeans and palm oil are used to produce biodiesel, a substitute for crude oil). Between 2004 and 2008, world food prices in real terms went up by 55 percent along with the prices of energy-based agricultural inputs. The main commodity indices not only have continued their upward movement, but have also become more volatile.[1] By November 2011, energy and metal prices were more than double their prices at the end of 2008. Agriculture and fertilizer prices also exceeded their end-of-2008 levels, though at a smaller magnitude. Volatility in commodity prices has become

[1] One may argue that, in real terms, current prices including those in the 2007–08 episode are well below those observed in 1974. However, price volatility (as measured by standard deviation) in 2008 was higher than that in 1974.

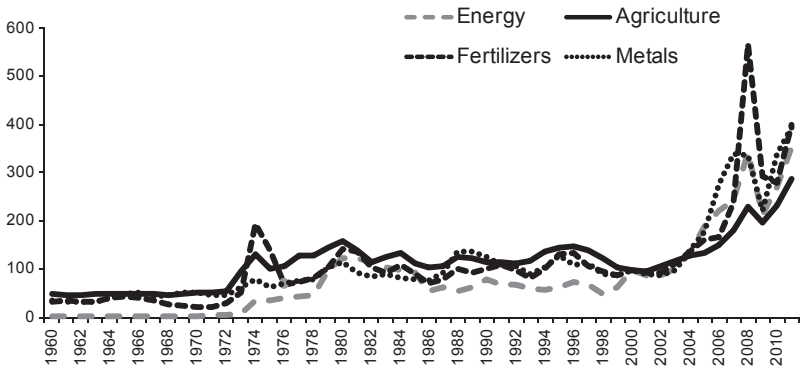

Figure 14.2 Synchronized Movements in Nominal Commodity Price Indices (*2000 = 100*)

Source: World Bank Commodity Price Data.
Note: Data for 2011 are the average of January to November 2011.

more pronounced from 2006, fluctuating within a much wider band than ever before.[2]

In recent years, world food prices have been driven by strong growth in emerging economies, declining agricultural investments, low productivity, high input costs, unfavorable weather, diversion of food for biofuels production, and distortionary "beggar-thy-neighbor" policies, such as export restrictions, among others. Although the 2010–11 price surge was somewhat similar to the one that occurred in 2007–08, it was characterized by different factors at work. First, the main drivers in the earlier period were structural causes such as rapidly rising demand from emerging economies, dwindling global stocks of food, active promotion of biofuels, and possible financialization of commodity markets. Recent price rises, however, were fostered more by weather disturbances, natural calamities, and protectionist trade policies.

Second, in 2007–08, the surge in food prices was led by energy, which impacted grain prices directly and indirectly. Third, while earlier rises in prices were uniformly higher for most foods, the recent increase was less sharp for rice. This is particularly important for developing Asia, which hosts 8 of the top 10 rice producers (contributing more than 95 percent of their combined total) and 7 of the 10 leading exporters. The scene is somewhat less Asia-centric for wheat, for which Asian economies are relatively more self-sufficient. Between June 2010 and May 2011, wheat and corn prices doubled, but rice prices increased by less than 20 percent as Thailand and Vietnam, two of the world's largest exporters, freed exports and the Philippines, the world's single largest importer, dropped the government monopoly on imports due to better domestic crop prospects. However,

[2] Moreover, the frequency of natural disasters has increased, with more occurring in the Asia and Pacific region. Between 2001 and 2010, of the world total, the region accounted for 90 percent of the people affected, 65 percent of those killed, and 38 percent of economic damages, exceeding its share of world GDP (UN-ESCAP, 2011).

rice prices gained strength in July 2011 (as Thai farmers withheld rice following a government pledge to pay farmers about 50 percent above the market rate) and then remained firm as the government implemented the policy in October. This was aided by the negative effects of floods in Cambodia, Thailand, and other countries in Southeast Asia. The relaxation of export restraints by India after a four-year ban dampened the prices only slightly. Prices of corn, wheat, and rice, which provide the world with most of its food energy, have gone down relatively, but they have settled on a higher plane.

The supply conditions now are better than they were in 2008. The November 2011 World Agricultural Supply and Demand Estimates report of the U.S. Department of Agriculture shows an estimated 405 million metric tons of grains ending stock in 2010/11, which far exceeds the below 380 million metric ton estimate for 2007/08. Although better weather conditions and lifting of trade restrictions have improved the prospects for food supply, the likelihood of rapid growth in these prices again soon cannot be ruled out. The latest Department of Agriculture estimates show a lower ending stock for grains in 2011/12 compared with the previous year as growth of total usage is expected to outpace growth of total supply. With low global stocks, small shortfalls in supply can significantly affect prices.

The rest of this chapter is organized as follows. We discuss economic impacts of price changes on developing Asia, followed by an assessment of policy priorities for the region in the face of various constraints and challenges. We then conclude with selected policy recommendations at the global, regional, and national levels.

ECONOMIC IMPACT OF GLOBAL PRICE MOVEMENTS

The frequency with which food price spikes have occurred in recent years has raised policy challenges associated with not only ensuring food security, but also reducing poverty and maintaining macroeconomic stability. High and volatile food prices adversely affect growth, employment, external accounts, and fiscal positions of governments. These prices are having knock-on effects in Asian economies, especially those in which supply and demand conditions are tight. Countries with rapidly growing domestic demand particularly face the risk of second-round effects of higher food prices spilling over to higher prices of other goods and wages. Such a situation can cause inflation to become entrenched and create a wage-price spiral. By spurring inflation, food prices have necessitated monetary tightening, thereby affecting the robust growth record of the region. The persistence of high prices has also provoked fiscal measures such as higher consumer subsidies and farm support, which have dented the hitherto generally strong fiscal positions of Asian governments. In food-importing countries, high world market prices have created strains on balance of payments through depletion of foreign exchange reserves. For example, for the Philippines, the rice import bill multiplied almost five times in 2008.

Vulnerability of the Poor

A number of studies show that food price inflation is a regressive tax. In the developing world, the lower the level of household income, the larger is the fraction of income spent on food (ADB, 2008; de Hoyos and Lessem, 2008). The food share falls by between 8 and 14 percentage points as development levels rise from low to high incomes (Anker, 2011). Interestingly, the food expenditure shares in developing Asia are much larger than in Africa, Latin America, and advanced economies, making it particularly vulnerable to food price shocks (see Figure 14.3 and de Hoyos and Lessem, 2008). Additionally, the income elasticity of food expenditure also falls with per capita income, declining from around 0.8 for low-income countries to 0.7 for lower-middle-income countries, 0.6 for upper-middle-income countries, and 0.3 for high-income countries (Anker, 2011). This means that any fall in income, say, arising from higher food prices, will give a much larger food consumption shock to the poor.

In addition to the high household expenditure on food by the poor, consumer price indices in Asia boast a much higher share of food as well compared to richer economies (Table 14.1). This implies that a rise in food prices will contribute more to inflation in developing than in advanced economies. In some of the larger countries of the region, such as Bangladesh, Cambodia, India, and Sri Lanka, the share exceeds 45 percent. Even where it is lower (e.g., up to 35 percent in China, Malaysia, and Thailand), the food share in inflation is still much higher than that observed in advanced economies. In contrast, in the United States and the euro area, the food share in the CPI basket is below 15 percent, and in Japan, it is below 26 percent.

Even if food prices plunge, they remain high by historic standards, and this can seriously dent the budgets of poor families in the region. This brings significant challenges to economies in Asia, which is home to two-thirds of the

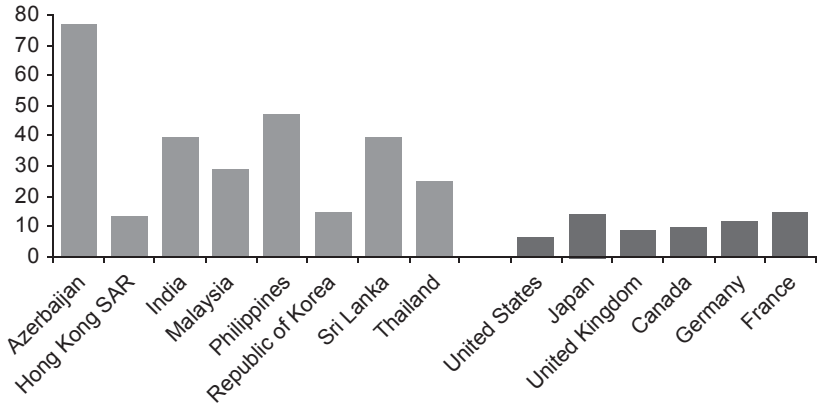

Figure 14.3 Share of Food Expenditures in Total Household Expenditure (*Percent*)
Source: U.S. Department of Agriculture Economic Research Service.

TABLE 14.1

Food Share in Consumer Price Index (*Percent*)

Economy	Share	Economy	Share
Bangladesh	58.8	Indonesia	36.2
India	46.2	Thailand	33.0
Sri Lanka	45.5	Malaysia	30.3
Cambodia	44.8	China	30.2
Pakistan	40.3	United States	14.8
Vietnam	39.9	Euro area	14.0
Philippines	39.0	Japan	25.9

Source: Asian Development Bank (2011b).

world's poor (Wan and Sebastian, 2011). Food price variations bring distributional issues to the forefront of economic policy as governments seek to protect the vulnerable populations, including the undernourished and hungry people. In general, the urban poor are the most affected by high prices, followed by the rural poor, especially those who do not produce any food for self-consumption. Although better protected, even farmers who are net food sellers could be adversely affected as input costs (such as fuel, fertilizers, irrigation, and transportation) rise along with food prices. With low and volatile prices, farmers will be unable to recover their investments.

As noted earlier, according to ADB estimates, a 10 percent increase in domestic food prices would increase the poverty rate in developing Asia from 27 percent to 29 percent, based on a $1.25 a day poverty line (see Figure 14.4 and ADB, 2011a). In low- and middle-income countries across the world, food price increases may have pushed about 44 million more people into poverty in 2011 in comparison with 105 million in 2008 (Ivanic, Martin, and Zaman, 2011). By 2012, an additional 31 million people in low-income countries may fall into

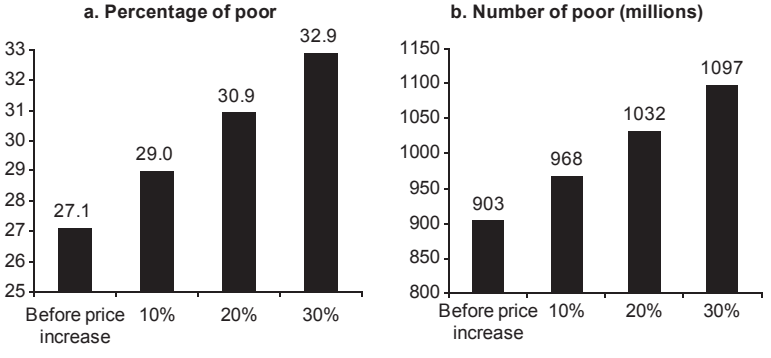

Figure 14.4 Food Inflation Could Lead to Rising Poverty

Source: Asian Development Bank (2011a).

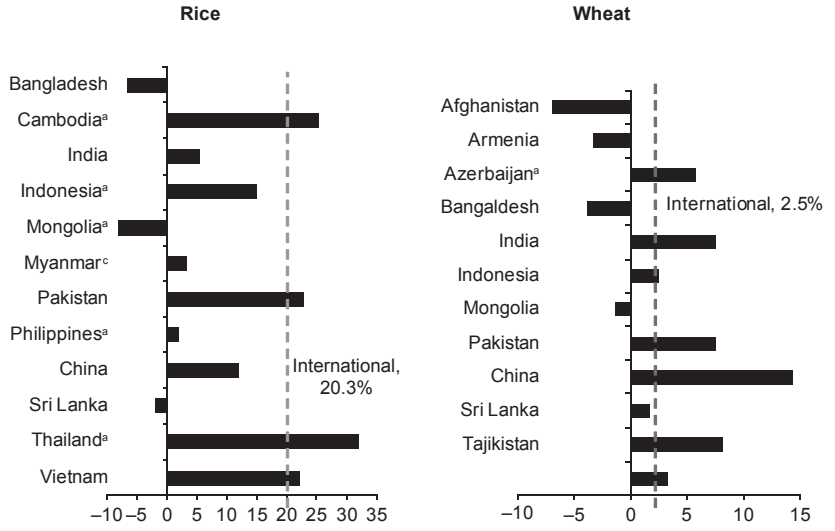

Figure 14.5 Increase in Domestic Prices of Rice and Wheat, November 2011 (*Percent, year over year*)

Source: Asian Development Bank staff calculations using the Food and Agriculture Organization's *Global Price Monitor*.
Note: International rice price (Thai 100 percent Grade B); international wheat price (U.S. hard red winter).
[a] August 2011.
[b] September 2011.
[c] October 2011.

poverty with higher food prices (IMF, 2011).[3] The affected populations would include middle-income earners as well. Such impacts on local populations can create a serious political problem for authorities as reflected in social unrest and protests in many countries following the 2007–08 food price crisis. Predictably, governments across Asia spend large sums of money to control the problem.

Impact on Fiscal Costs

Concomitant with the rise in international food prices and rapid growth in the region, the first half of 2011 saw intensifying price pressures in Asia. As Figure 14.5 shows, domestic rice and wheat prices in many economies have followed the rise in international grain prices.[4] However, the effect is muted compared to the situation that would have occurred had the countries allowed complete pass-through of global food prices to domestic markets. Local prices would have been higher in the absence of aggressive fiscal interventions (such as higher subsidies and lower taxes and tariffs on food) that Asian governments implemented

[3] Based on commodity futures options, this scenario assumes that relative to the *World Economic Outlook* baseline scenario as of September 2011, food prices would increase by 25 percent in 2011 and 31 percent in 2012, fuel prices by 21 percent in 2011 and 48 percent in 2012, and metals prices by 21 percent in 2011 and 36 percent in 2012.
[4] While in most countries the domestic price rise remains relatively subdued, in a limited number of countries, the rise in domestic prices is outpacing that in international prices due to local supply and demand factors.

in the wake of the food price spikes. Although the global price pressures have subsided, the levels of domestic food prices in general remain high.

To protect the poor from the high food prices, governments adopt a variety of fiscal instruments such as higher subsidies, lower food taxes and tariffs, and scaled-up public transfers. For example, food and fertilizer subsidies make up the bulk of nonenergy subsidies in Indonesia. In 2008, at the peak of food prices, they accounted for 0.56 percent of GDP (Table 14.2). Food subsidies multiplied almost three times within a span of four years between 2006 and 2010, while fertilizer subsidies rose by close to six times during the same period. The fertilizer subsidy alone accounts for more than double the budget of the Ministry of Agriculture at the Indonesian central government level.

In India, food and fertilizer subsidies reached 2.2 percent of GDP in the fiscal year 2008/09 (Table 14.3). These subsidies increased sharply in the last six years, increasing from 415 billion rupees (Rs) in 2005/06 to over Rs 1 trillion in 2010/11. The current figure is a marked reduction from 2008/09, which showed food and fertilizer subsidies shooting up to Rs 120 trillion from the earlier-year figure of Rs 638 billion due to skyrocketing prices. To contain the costs, the government is considering various directions for reforming its food subsidy program.

In the Philippines, the expenditures of the National Food Authority—which is mandated to control domestic rice prices—amounted to about 1.5 percent of GDP in 2010. Reforms are currently being undertaken in the Authority, which has long been criticized for being inefficient in the performance of its mandate. In 2010, it incurred an income loss of more than 30 billion Philippine pesos. These figures suggest serious leakage and undercoverage problems in the program. Although the government has tried to improve targeting by limiting rice distribution to only Family Access cardholders, considerable leakages and exclusions remain due to the lack of household-level data needed for identifying eligible beneficiaries (Usui, 2011). These large fiscal interventions have unintended

TABLE 14.2

Food and Fertilizer Subsidies in Indonesia
(*Percent of GDP*)

	2006	2007	2008	2009	2010
Food subsidy	0.16	0.17	0.24	0.23	0.24
Fertilizer subsidy	0.09	0.16	0.31	0.33	0.29
Food and fertilizer subsidies	0.25	0.33	0.55	0.56	0.52

Source: Ministry of Finance, Budget Statistics, 2006 to 2012.

TABLE 14.3

Food and Fertilizer Subsidies in India
(*Percent of GDP*)

	2005–06	2006–07	2007–08	2008–09	2009–10	2010–11
Food subsidy	0.6	0.6	0.6	0.8	0.9	0.7
Fertilizer subsidy	0.5	0.6	0.7	1.4	0.8	0.6
Food and fertilizer subsidies	1.1	1.2	1.3	2.2	1.7	1.3

Source: Ministry of Finance, Economic Survey, 2010 to 2011.

negative side effects, such as pilferage and smuggling of food and embezzlement of funds.

Macroeconomic Impacts on Asian Economies

Undoubtedly, high food prices have contributed heavily to general inflation in Asia because of the high share of food in CPI (Figure 14.6). The effect is particularly noticeable in Bangladesh, China, Sri Lanka, and Thailand, where food price inflation accounted for more than 60 percent of the CPI inflation. Because food cannot be substituted with other goods, its high contribution to general inflation adds further to the misery of the poor. Commodity price stability is important from a broader macroeconomic perspective because volatility in one commodity price can spill over to other commodities (e.g., from wheat to rice or from fuel to food, as seen over the duration of 2011), thereby increasing uncertainty throughout the economy.

Rising food prices not only have fueled inflation, but are also expected to affect growth in developing Asia. To estimate the level of their impacts in 2012 and 2013, we carried out a simulation analysis using the Oxford Economics Global Macro Model, which is a quarterly linked international macroeconometric model. The model comprises 44 country models that are fully interlinked via trade, prices, exchange rates, and interest rates and divided into six trading blocs to complete the world coverage. The blocs of world variables include oil and commodity prices, world GDP, and industrial production, among others. In the country models, functional forms of equations are identical in structure, but the bigger models incorporate greater disaggregation and more financial sector detail. The macroeconometric approach provides both forecasting and policy analysis tools. As a

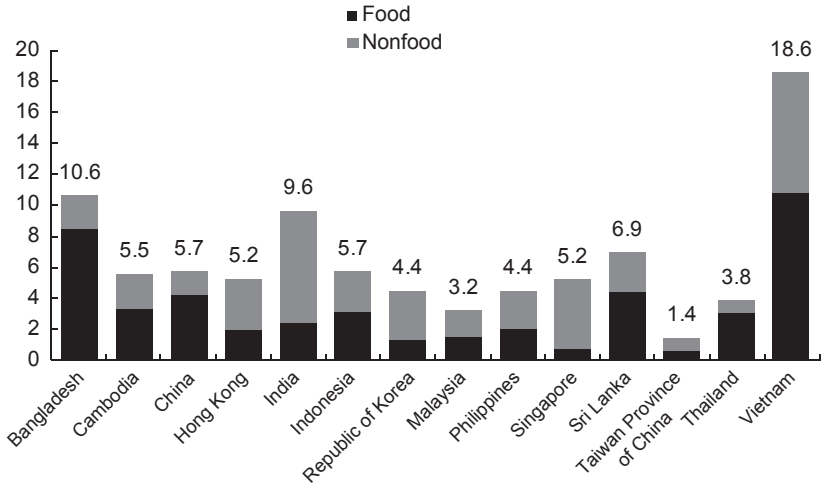

Figure 14.6 Contributions to CPI Inflation, January 2011–Present (*Percentage points*)
Source: CEIC Data Company.

TABLE 14.4

Inflation and Growth Effects in Developing Asia
(*Percentage Point Change from 2011*)

	Inflation		Growth	
	2012	2013	2012	2013
China	0.28	0.19	–0.06	–0.07
Hong Kong SAR	0.16	0.33	–0.11	–0.11
Korea, Rep. of	0.12	0.05	–0.12	0.12
Taiwan Province of China	0.16	0.07	–0.24	0.23
India	0.69	0.35	–0.06	–0.20
Indonesia	0.34	0.20	–0.11	–0.18
Malaysia	0.36	0.17	–0.10	–0.19
Philippines	0.39	0.20	–0.18	–0.11
Singapore	0.66	0.37	–0.61	–0.73
Thailand	0.36	0.19	–0.11	–0.13

Source: Asian Development Bank staff estimates using the Oxford Economics Global Macro Model.

general equilibrium model, it traces the economy-wide effects of exogenous shocks and allows for endogenous monetary policy responses to shocks.[5] It generates projections of key economic variables for 10 developing Asian economies: the People's Republic of China, Hong Kong SAR, India, Indonesia, the Republic of Korea, Malaysia, the Philippines, Singapore, Taiwan Province of China, and Thailand.

Our estimates show that domestic inflation is expected to pick up with the increase in global food prices. In particular, in India and Singapore, it is likely to result in an increase in the inflation rate in 2012 larger than half a percentage point (Table 14.4). In the absence of a domestic agriculture sector, Singapore's economy is completely reliant on the global market for food, whereas India's inflation is mostly homegrown. Likewise, a 10 percent increase in global food prices would decrease real GDP growth of developing Asian countries by 0.06 to 0.61 percentage points in 2012.[6] The smallest growth impact would likely be seen in more self-dependent countries such as China and India, while Singapore would once again be the worst affected from a global price rise.

STRUCTURAL CONSTRAINTS, CHALLENGES, AND NEW POLICY IMPERATIVES

Changes in price trends are affected by factors different from those influencing price volatility. The distributional consequences of and appropriate policy responses to address price trends and volatility therefore differ as well. This

[5] In this model, the price transmission mechanism and monetary policy are endogenous. It is assumed that there is 100 percent pass-through of world prices in importing countries and that interest rates in Asia are determined so as to bring inflation rates within a band around a target.

[6] Positive effects on GDP growth by the Republic of Korea and Taiwan Province of China for 2013 are driven by subdued inflationary impacts in their economies.

section examines policy priorities arising from the constraints and challenges faced by developing Asian economies. To stay focused on the most important policy choices, we have selectively chosen what seemed to be the crucial areas in which the Asian experience can contribute to global decision making. These choices, of course, need to be supplemented with the usual policy and institutional reforms to reduce distortions, create a level playing field, and increase economic efficiency.

Restore Confidence in Global Food Trade

To protect their populations from erratic world price movements, many countries have implemented trade barriers and begun focusing on inward-looking self-sufficiency initiatives. However, acting in self-interest, the authorities do not realize that such protectionist policies have a direct spillover effect on global prices.

High and volatile world market prices generate panic herd behavior by both exporting and importing countries. For instance, in the wake of the 2008 food price crisis, at least 30 exporters imposed export restrictions or bans on agricultural commodities, especially on rice. At the same time, 84 low- and middle-income importing countries reduced food taxes and tariffs (IMF, 2008). More recently, Brunei Darussalam increased its rice self-sufficiency target from a low of 3 percent to 60 percent. The Philippines is also targeting total rice self-sufficiency by 2015.

Domestic insulation policies cause inefficiencies and increase food price volatility further, both globally and nationally. When world prices are high, export restrictions to protect domestic consumers create distortions, deprive domestic producers of the gains from higher export prices, and exacerbate the problem of high world prices. Likewise, if domestic farmers are shielded from world price volatility by an increase in tariffs when world prices are low, they indiscriminately harm all domestic consumers by raising local market prices and distort price signals. In contrast, tariff reductions can help reduce inefficient trade distortions and mitigate price increases. There is evidence that food price volatility has been higher in periods when trade has been impeded, such as during the World War I and World War II and the breakdown of the Bretton Woods regime in the 1970s. Martin and Anderson (Chapter 17) note that during the price spikes in 2006–08, 45 percent of the increase in rice prices and 30 percent in wheat prices could be attributed to insulating behavior of individual governments.

If exporters impose export restrictions and importers reduce tariffs to insulate their domestic markets completely from world markets, then the net effect is to simply raise world prices (see Chapter 17). Coordination failures through such antitrade policies are also a typical example of a zero-sum game with poor countries like the sub-Saharan African economies (which import more than half of their rice from Asia) being most adversely affected. Lifting trade bans and promoting multilateral negotiations such as the Doha Round is an important step toward restoring confidence in food trade. Although trade liberalization may

expose countries to external vulnerability, evidence shows that progressive dismantling of barriers against international trade has been an important source for the rise of Asian economies as key players on the international scene (ADB, 2011c). Though conclusion of the Doha Round may not reduce food prices in the short term, it will advance efficient agricultural production in the long term and boost global growth.

Rechannel Public Spending

We previously noted that fiscal costs of shielding consumers from global price effects are significant and have many unintended side effects. In developing Asian economies, social safety net programs are usually riddled with problems of leakage, poor targeting, and inefficiencies in operation. The poor targeting of program beneficiaries leads to high levels of inclusion (unintended households are included as beneficiaries) and exclusion (intended households are excluded as beneficiaries) errors, limiting overall impacts of the programs funded by scarce public resources.

For example, India spends over 2 percent of its GDP on various antipoverty and social protection programs, amounting to 40 percent of the annual rural poverty line in 2004–05 (World Bank, 2011). Yet despite several reforms, the poor are not able to reap the full benefits of such large investments because of weak design of the programs and limited administrative capacity of state governments. Moreover, allocations of social protection funds to state governments are regressive. In the Philippines in 2009, over 60 social protection programs were in place and implemented by as many as 20 agencies, which resulted in poor coordination among the implementing agencies and duplication of program beneficiaries. A recent study shows that 31 percent of the lowest income quintile is not able to access the programs, whereas 12 percent of the highest income quintile has accessed the programs (Reyes, Sobreviñas, and de Jesus, 2010). Moreover, 36 percent of the poor do not benefit from the programs, whereas 49 percent of the beneficiaries are not poor. Additionally, geographic distribution of subsidized rice is not sensitive to regional poverty incidence. The leakage rate in the urban national capital region at 87.8 percent is the highest in the country. Poorly designed subsidies in the two countries are characterized by leakages to the rich, large diversions of food from the system, and excess costs arising from inefficiencies, tremendously reducing their effectiveness (Jha and Ramaswami, 2012). Given such economic waste, even if inclusion errors were minimized to zero, the share of the poor would rise to at most 35 percent in the Philippines and 29 percent in India.

Governments thus need to think of better ways to help the poor. In the short term, such measures could include replacing general subsidies with integrated social safety nets, which can reach the poor more efficiently and effectively. These include subsidies targeted to the poor (e.g., cash transfers, school lunch programs, food for work, and food stamps), geographical targeting, self-targeted programs subsidizing items that are disproportionately consumed by the poor, and programs for vulnerable populations based on their socioeconomic and

demographic characteristics, such as the elderly, children, or the unemployed. Implementation of targeted transfer programs can, however, be challenging. Weak institutions and inadequate administrative capacity hinder the implementation of mechanisms to protect the poor.

The best option in the longer term is to develop well-targeted social safety nets that can protect vulnerable households in the face of rising prices. Indexing the program benefits to inflation will ensure automatic compensation to the poor when prices rise. Implementation of such programs, however, requires development of administrative capacity. In the interim, Asian economies are increasingly adopting conditional cash transfer programs. To achieve the expected goals, such programs should be designed carefully for better targeting, higher delivery capacity, effective implementation, and careful monitoring and evaluation.

In the longer term, there is also a need for expenditure shifting from general subsidies toward more public investment for the agriculture and food sectors (irrigation water management, transport and trade logistics, regional emergency reserves, and food supply chains). Additionally, farm support programs can help increase output if they are carefully designed and focus on increasing the productivity of small farmers. Reorienting public expenditure obviously creates competition for scarce fiscal resources but promises more economic efficiency and better distributional gains in return.

COOPERATE TO MAINTAIN AND MANAGE REGIONAL GRAIN RESERVES

To address rising food price volatility, grain reserve management has become an important agenda item in the G-20 discussion. In this context, the Asian experience has a few lessons to offer. Asia has a long history of emergency grain reserve management based on the premise that a permanent regional cooperation mechanism for managing food reserves could serve as the region's insurance in times of food crises.

Following a spate of unexpected instabilities in supply and production, members of the Association of Southeast Asian Nations (ASEAN) agreed in 1979 to establish an ASEAN Emergency Rice Reserve (AERR). The reserve consisted of voluntary national food security stocks earmarked to address food emergencies. A country experiencing a food emergency was defined as one "having suffered extreme and unexpected natural or man-induced calamity, which is unable to cope with such state or condition through its national reserve and is unable to procure the needed supply through normal trade" (Briones, 2011). Members earmarked 50,000 tons from their national food stocks that could be released via bilateral negotiations. However, this instrument could never be used due to flaws in its design and ineffective operational mechanisms. For instance, despite a severe rice shortage in 1997, Indonesia was unable to take advantage of the tool (Daño, 2006). Similar regional emergency reserves were held at different time periods in other parts of the world, including the International Emergency Food

Reserve established by the World Food Programme in the 1970s and the South Asia Association for Regional Cooperation Food Security Reserve in the 1980s. Each of these cooperation arrangements, however, failed because they turned out to be expensive and ineffective (Wright, 2009; Briones, 2011). Some of the factors contributing to the failures were a large share of contributions tied to specific commodities and emergencies, the small size of the reserves, cumbersome delivery procedures, lack of funds for the secretariat, and bilateral negotiations that faced opposing pressures from food-exporting and -importing countries.

Also, with greater openness to trade following the WTO agreements, the importance of domestic buffer stocks for price stabilization has diminished for both exporting and importing countries, while variable levies have emerged as an alternative option to stabilize domestic prices.[7] This is reflected in the declining levels of global food stocks over recent years. More open trade means that domestic crop shortfalls can be compensated for by buying on world markets. Likewise, excess production in the domestic economy can be exported. Access to higher international trade thus facilitates price stabilization within individual countries without their holding large buffer stocks.

However, repeated occurrence of simultaneous weather shocks in several countries across the world has reignited an interest and provoked governments to reexamine the merits of holding stocks. In particular, the G-20 Agriculture Ministers agreed at their meeting in June 2010 to pilot small regional emergency food reserves that could be used to replenish national safety net buffers. Learning from past experiences and to address the shortcomings, in 2004, ASEAN+3 countries initiated a pilot project, the East Asian Emergency Rice Reserve (EAERR).[8] The project was planned as a mutual assistance system to share rice stocks among the 13 ASEAN+3 countries and to contribute to price stability of rice in the region (ASEAN, 2009). It was initially established for a three-year period, but was subsequently extended to 2010. A project steering committee that reported to the ASEAN+3 was tasked with oversight, and day-to-day management was vested in a management team (Briones, 2011).

Reserves were composed of earmarked reserves (under AERR), now totaling 787,000 tons, and stockpiled reserves (rice stocks or in-kind donations to the rice reserve). Releases from the earmarked reserves could be made on grant terms under a special commercial transaction, governed by a loan or grant agreement from the earmarking country, or to meet the acute emergency needs of disaster victims. Some of these mechanisms were successfully pilot tested. Based on the favorable experience of the EAERR pilot project, the establishment of a permanent reserve scheme called the ASEAN+3 Emergency Rice Reserve (APTERR) is now underway.

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[7] Unlike buffer stocks that are held to stabilize food prices within a price band, much like open market operations by central banks, emergency stocks are held during normal times for use when prices go beyond an unacceptable limit due to an emergency situation.

[8] ASEAN+3 comprises the 10 ASEAN member states, plus China, Japan, and the Republic of Korea.

APTERR provides for a permanent institutional framework—a governing council consisting of country representatives, decision making by consensus, and a secretariat to undertake day-to-day management of the reserve program. The agreement also provides for financial contributions for the regular support of APTERR's overhead costs.

The new structure of EAERR was built on the lessons learned from past failures in establishing well-functioning reserve mechanisms. Among those, three lessons stand out for designing such tools in the future:

1. The reserves should be sufficiently large to address great needs.
2. The price determination mechanism matters. In the previous case of AERR, bilateral negotiations between exporters and importers did not work because of political constraints, which meant that the negotiated price could not be different from the market price. This obviously led to the criticism that the scheme was not very useful. Thus, to avoid political pressure, the system had to be redesigned. A multilateral price determination mechanism was introduced and an EAERR secretariat set up to facilitate decision making by consensus.
3. Such emergency reserve stocks cannot be a panacea for disasters of all scales. Rather, there should be more realistic expectation from reserve stock management, which is a tool good mainly for idiosyncratic country-specific shocks, not for large-scale or systemic global or regional calamities.

Enhance Agricultural Productivity and Improve Supply Chains

Asian agriculture suffers from low TFP growth. Data from 116 countries from 1961 to 2001 show that while the global production frontier in agriculture has advanced rapidly, agricultural TFP growth in all developing regions has been falling away from the frontier (Hertel, Ludena, and Golub, 2006). Low agricultural labor productivity and persistent gaps in yield (output per hectare of land), reflecting the difference between potential and actual yields, have become critical binding constraints in improving food production in Asia.

Poor countries typically have the largest share of labor hours in agriculture, while rich countries have the smallest share (Duarte and Restuccia, 2010). As less-developed countries advance through structural transformation over time, there is a systematic fall in the share of labor allocated to agriculture and an increase in shares of employment in the industrial and service sectors. With the movement of surplus labor out of agriculture, labor productivity rises. In China, India, and some other Asian countries, high-productivity employment opportunities have expanded and structural change has contributed to overall growth (McMillan and Rodrik, 2011). Yet agriculture constitutes the main source of employment in many economies of the region, absorbing as much as 40 to 60 percent of the labor force. Gaps in labor productivity between different sectors,

therefore, continue to be large, and this ensures significant potential for rapid economic growth.

Similarly, average yields of staples rice and wheat in much of the region remain far below potential levels (Cassman, 1999; Jha, Srinivasan, and Landes, 2007; Godfray and others, 2010). Only three developing Asian countries among the top 10 rice producers in the world—China, Indonesia, and Vietnam—were able to surpass average global yields over the past decade. ADB (2011a) estimates have shown that if the yields in the six major rice-producing countries (Bangladesh, Brazil, India, Myanmar, the Philippines, and Thailand) that are below the global mean could be raised to just the world average, global rice production would increase by more than 10 percent. If, however, yields of these six countries could match the maximum global yield, worldwide rice production would expand by a whopping 170 percent.

Market imperfections, distortions, and weak public incentives, however, keep these economies far below the attainable productivity frontier. Therefore, exploiting the productivity potential depends on many factors and will not be easy. It will require reforms, diversification, and structural change (Hausmann, Rodrick, and Velasco, 2005). Indeed, agricultural productivity growth has accelerated in developing regions that undertook substantial economic reforms (Hertel, Ludena, and Golub, 2006). Another important cause of low productivity growth is low rates of adoption of modern agricultural technology, which can accelerate the process of structural transformation. In contrast, agricultural investment, which is essential in improving productivity, has been neglected by both individual governments and donor agencies, owing partly to a relatively flat trend in global food prices between 1960 and 2000. For example, between 2004 and 2010, agriculture's share of total investment varied between only 6 and 9 percent for India, while it was barely 2 to 3 percent for the China. Likewise, the share of agriculture in official donor aid saw a steep declining trend from about 20 percent in early 1980s to just about 4 percent by the mid-2000s before the food price crisis struck.

The rapidly dwindling world food stock position will not support the growing demand over the long term unless sustainable food production and supply-augmenting measures are implemented on a war footing. Indeed, one of the key G-20 recommendations is to improve agricultural production and productivity. Increasing agricultural productivity in low-income countries by narrowing the yield gap, expanding cultivated areas, and facilitating structural change can greatly improve rural incomes and enhance long-term food security.

However, focusing on the farm sector alone will be inadequate to ensure food security. Weak marketing infrastructure (processing, storage, transport) and lack of market access keep the prices of inputs and the cost of moving agricultural produce to markets high. This reduces returns to farmers and increases food prices. Increasing yields and closing labor productivity gaps alone will therefore not bring all of their potential benefits to farmers and consumers unless post-harvest facilities and the food supply chain are improved to reduce waste and transform the food processing and distribution systems. Without the facilitating measures for market access and complementary investment to cater to the world

market, larger production will simply translate into excessive inventories with falling prices and little net value added (Jha and others, 2010).

Through an organized system of exchange from production to consumption, the value chain can increase the value and competitiveness of agricultural products. This seems to be an attainable goal. Indeed, postharvest losses could be reduced to a third by shifting from traditional to mechanized systems (Gummert, 2011). In addition, 50 to 70 percent of Asian consumers' cost of food is formed in the post-farm-gate segments of food chains. This implies that the need for research and development is not just at the farm level (which was the case during the green revolution era), but also through the whole food supply chain. Improving supply chains has another benefit in terms of absorbing surplus farm labor into nonfarm employment, which is yet another means of enhancing labor productivity.

SUMMARY AND CONCLUDING REMARKS

Not only has the food price surge that began in 2007–08 and, after subsiding briefly, picked up speed again in 2010–11 continued its upward movement, but prices have also become more volatile. These movements have brought significant policy challenges to economies in Asia, where two-thirds of the world's poor live. The Asian poor spend large fractions of their income on food in comparison with the rich, and therefore rising food prices act as a regressive tax. Furthermore, due to the high share of food in CPI, food prices have contributed heavily to general inflation in Asia compared to advanced economies. Rapidly rising and volatile food prices increase poverty, inequality, and social unrest. Our estimates show that if food prices continue their recent trends, they will add further to inflation in 2012 by between 0.12 and 0.69 percentage points and cut growth by between 0.06 and 0.61 percentage points across developing Asian economies.

To counter food price inflation, many countries in the region have imposed trade barriers and focused attention on inward-looking self-sufficiency policies. However, national policies that insulate domestic markets from world markets increase global food price volatility even more, as evidenced through 2010 and 2011. Restoring confidence in global food trade and discouraging governments from resorting to such market-distorting policies is crucial for reducing market volatility.

At the regional level, repeated incidents of bad weather across the world have reignited an interest in holding emergency grain reserves. This is a plausible avenue to address idiosyncratic price shocks in individual countries. Emergency reserves can supplement domestic buffer stocks but not replace them. Asia offers a long and rich experience with such reserves that could significantly contribute to the ongoing G-20 discussions.

As Asian governments seek to protect their vulnerable populations from the impact of higher and volatile food prices through subsidies and safety net programs, they add significantly to their fiscal costs. On the positive side, though,

these expenses have helped to limit the pass-through of international prices to domestic markets; local prices would have been even higher in the absence of such public spending. However, these interventions have also had unintended side effects through pilferage, smuggling, and embezzlement of scarce public resources. To reduce the problems of leakage and poor targeting, governments should focus on designing efficient and well-targeted safety net mechanisms.

In the longer term, increasing productivity is the key to enhancing food security through higher supplies. That is, investment in agriculture must increase, because inadequate marketing infrastructure and lack of market access reduce returns to farmers and increase food prices. But focusing only on research and development and agricultural infrastructure in the farm sector will not suffice. Countries must focus on the whole supply chain that transfers food from the farm gate to the food plate of both domestic and foreign consumers. Indeed, investment in postharvest technology should be implemented quickly.

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