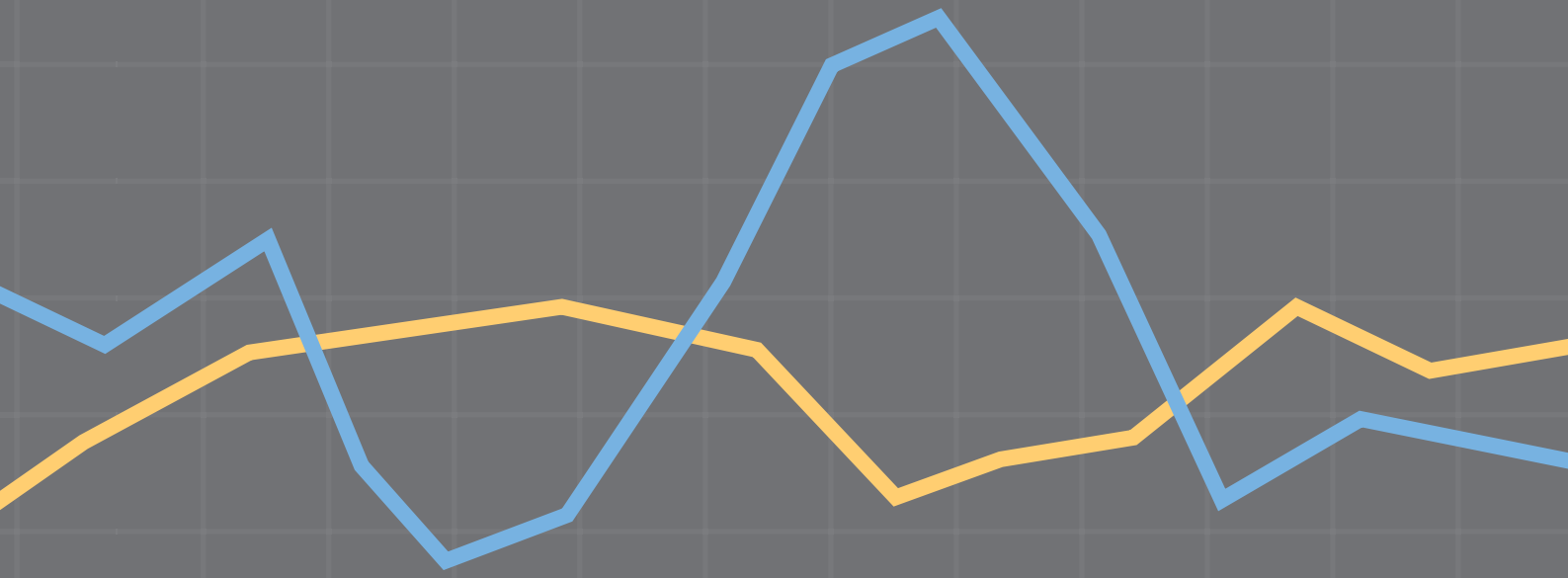
RAP Publication 2012/17



FOOD PRICE SPIKES, INCREASING VOLATILITY AND GLOBAL ECONOMIC SHOCKS:

COPING WITH CHALLENGES TO FOOD SECURITY IN ASIA

A comparative regional study of the experiences of ten Asian economies

Sisira Jayasuriya
Purushottam Mudbhary
Sumiter Singh Broca

Food price spikes, increasing volatility and global economic shocks: coping with challenges to food security in Asia

A comparative regional study of the experiences of ten Asian economies

Sisira Jayasuriya
Purushottam Mudbhary
Sumiter Singh Broca

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS
REGIONAL OFFICE FOR ASIA AND THE PACIFIC
BANGKOK, 2012

ISBN 978-92-5-107320-9

Cover design: Veerawatchara Suksantinunt

For a copy of this publication, please write to:

Sumiter Broca
FAO Regional Office for Asia and the Pacific
Maliwan Mansion, 39 Phra Atit Road
Bangkok 10200
THAILAND
Tel: (+66) 2 697 4000
Fax: (+66) 2 697 4445
E-mail: RAP-Publications@fao.org

Contents

Tables

Figures

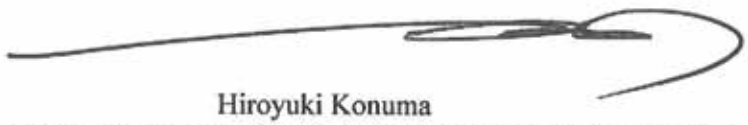
Foreword

Asia is not only the most populous and the most economically vibrant region in the world today but also home to the largest number of poor and food insecure people in the world. Improving and sustaining food security in Asia poses formidable challenges in an increasingly unstable global economic environment. During the past five years the region has had to confront two sharp price spikes (in 2007-08 and 2010-11) and the impact of the global economic crisis that followed the global financial crisis of 2008. Though Asia coped with these huge shocks without a slide to large scale food insecurity or economic crises, it is clear from recent developments in global food markets and the ongoing turmoil in the global economy that there is no room for complacency.

The experiences of developing countries of Asia that confronted these multiple shocks and crises in recent years are an important source of policy lessons and guidance but remains to be adequately studied. In 2009 FAO-RAP initiated a comparative regional study involving detailed, in-depth case studies of Bangladesh, Cambodia, China, India, Indonesia, Nepal, Philippines, Sri Lanka, Thailand and Vietnam, with a view to analyzing the causes, evolution, impacts and policy responses, and to synthesize the policy lessons and formulate recommendations to deal with future food security issues within the context of wider economic shocks.

FAO-RAP was able to bring together a distinguished group of food policy experts with in-depth knowledge of the country situations to contribute to this important collaborative endeavor. The country studies were intensively discussed at the Policy Forum on Food and Financial Crisis in Beijing from 18-19 November 2010 hosted by the Agricultural Trade Promotion Centre, Ministry of Agriculture, People's Republic of China. This study presents a synthesis of those country studies, further extended to incorporate subsequent research focusing on aspects of food market volatility highlighted by the second price spike in 2010-11 and continuing economic instability in the region emanating from the fragility of the global economy. The study provides important methodological contributions to the understanding and analysis of food security issues and policies as well as a set of policy recommendations for consideration and discussion by the governments, international agencies and civil society organisations.

We hope that readers, particularly those concerned with agricultural development policy, will find this study both interesting and relevant to their work. FAO invites other national and regional institutions that are active in analytical and policy fields to join forces to continue and extend this policy oriented analytical and research effort.



Hiroyuki Konuma
Assistant Director-General and Regional Representative for Asia and the Pacific

Acknowledgements

The FAO Regional Office for Asia and the Pacific (RAP) is pleased to acknowledge its profound gratitude to the senior policy professionals from this region who collaborated with us by contributing country studies which forms the main basis for this regional study on food prices spikes and increasing volatility in the context of global economic shocks and their policy implications for food security in Asia and the Pacific. They are as follows: Uttam Deb (Bangladesh); Hossein Jalilian, Glenda Reyes and Lun Pide (Cambodia); Jikun Huang and Scott Rozelle (China); Simrit Kaur (India); Peter Warr and Arief Anshory Yusuf (Indonesia); Y. B. Thapa and Dilli Raj Khanal (Nepal); Rosemarie Edillon (Philippines); Jeevika Weerahewa and Sarath S. Kodithuwakku (Sri Lanka); Bhanuphong Nidhiprabha (Thailand); and Ian Coxhead and Vu Huang Linh (Vietnam). Rosemarie Edillon, also contributed to the analysis of price volatility and cross-border price transmission, and to the updating of the country developments, and Chandra Jayasuriya assisted with the preparation of figures.

We also take this opportunity to express our gratitude to the Agricultural Trade Promotion Centre, Ministry of Agriculture, People's Republic of China, which hosted the Policy Forum on Food and Financial Crisis in Beijing from 18-19 November 2010, where the first draft of the synthesis paper was discussed, and to the resource persons who attended the consultations in Bangkok and at the Policy Forum in Beijing.

The views expressed in this study are those of the authors and should not be attributed to the FAO or any of other organization.

Current institutional affiliations of researchers

Name	*Institution*	*E-mail address*
Coxhead, Ian	Department of Agricultural and Applied Economics, University of Wisconsin-Madison, USA	coxhead @ wisc.edu
Deb, Uttam	International Crop Research Institute for the Semi-Arid Tropics (ICRISAT), Hyderabad, India	u.deb@cgiar.org
Edillon, Rosemary		
Huang, Jikun	Center for Chinese Agricultural Policy, Chinese Academy of Sciences, Beijing, China	jkhuang.ccap@igsnrr.ac.cn
Jalilian, Hossein	Bradford Centre for International Development, University of Bradford, Bradford, UK	H.Jalilian@Bradford.ac.uk
Khanal, Dilli Raj	Institute for Policy Research and Development	drkhanal@gmail.com
Kodithuwakku, Sarath S.	Department of Agricultural Economics and Business Management, University of Peradeniya, Sri Lanka	sarathsk@pdn.ac.lk
Lun, Pide	Cambodia Development Research Institute (CDRI), Phnom-Penh, Cambodia	pide@cdri.forum.org.kh
Nidhiprabha, Bhanupongse	Faculty of economics, Thammasat University, Bangkok, Thailand	bhanupong@econ.tu.ac.th
Raju, S. S.	National Centre for Agricultural Economics and Policy Research (NCAP), New Delhi, India	raju@ncap.res.in
Reyes, Glenda	Cambodia Development Research Institute (CDRI), Phnom-Penh, Cambodia	
Rozelle, Scott	Dept of Agricultural and Resource Economics, University of California, Davis, USA	rozelle@stanford.edu
Thapa, Y. B.	SAARC Secretariat, Kathmandu, Nepal	yb_thapa@ntc.net.np
Vu, Huang Linh	World Bank, Viet Nam	<linhvu@irc.com.vn
Warr, Peter	Division of Economics, Australian National University, Canberra, Australia	Peter.Warr@anu.edu.au
Weerahewa, Jeevika	Department of Agricultural Economics and Business Management, University of Peradeniya, Sri Lanka	jeevikaw@pdn.ac.lk
Yusuf, Arief Anshory	Universitas Padjadjaran, Bandung, Indonesia	arief.yusuf@fe.unpad.ac.id

Abbreviations and acronyms

ADB	Asian Development Bank
ASEAN	Association of Southeast Asian Nations
CDRI	Cambodian Development Research Institute
CGE	Computable General Equilibrium
ESP	Economic, Social and Policy Assistance
FAO	Food and Agriculture Organization of the United Nations
FAO-RAP	FAO-Regional Office for Asia and the Pacific
GDP	Gross Domestic Product
GTAP	Global Trade Analysis Project
HLPE	High Level Panel of Experts
IMF	International Monetary Fund
R&D	research and development
SAARC	South Asian Association for Regional Cooperation
SAPTA	SAARC Preferential Trading Agreement
UNESCAP	United Nations Economic and Social Commission for Asia and the Pacific
US	United States of America
USAID	United States Agency for International Development
VAT	value-added tax
WTO	World Trade Organization

Executive summary

After two decades of relative stability and gradually declining real food prices, global food security is again under threat, due to a combination of high and volatile prices not seen since the 1970s and turbulence in the global economy, worse than anything seen since the 1930s. Two big price spikes in international food markets in recent years (2007/08 and 2010/11), in the context of global economic shocks, have highlighted the fragility of the global food situation and exposed serious weaknesses in the international food trading system.

This combination of high food prices and high price instability (or volatility) poses dangers to food security in a number of ways. In general, price fluctuations, even around a stable trend, impose costs on consumers, producers and governments facing liquidity constraints as is typically the case in developing countries. High prices and high volatility are often related and price volatility is generally higher during periods of high prices because of underlying tightness in supply and demand. High and volatile food prices are particularly bad for both countries and households when they occur in a period of general economic instability and shocks.

Asia, which has the largest numbers of poor and food-insecure people in the world, was affected directly and severely by the two recent food price spikes, as well as the global financial and economic crisis. In late 2008, analysts were predicting a massive increase in the number of hungry people in the world, with the largest increases projected to be in Asia.

By the end of this period, although hundreds of millions of people continued to be hungry and undernourished, there was an almost audible sigh of relief that the worst case scenario had been avoided: the increase in food insecurity in Asia turned out to be considerably less than feared, expected and projected in early 2008, despite a second price spike in 2010/11. Asian countries, to their credit, averted the feared increases in food insecurity and severe aggravation of poverty that were predicted (and feared) by economic modellers, analysts and international agencies, through aggressive and concerted policy action.

However, Asia's success came at a price; these policies imposed very substantial short-term and long-term costs on governments, households and the international food trading system.

The experiences of Asian developing countries that confronted these multiple shocks and crises in recent years are an important source of policy lessons and guidance. But this Asian experience, including that of the most populous countries of the world such as China, India, Indonesia and Bangladesh, has been insufficiently studied.

This study is a contribution towards filling this gap. It draws on analyses of the country experiences, based on a comparative regional study involving detailed, in-depth case studies of Bangladesh, Cambodia, China, India, Indonesia, Nepal, Philippines, Sri Lanka, Thailand and Vietnam, initiated by the FAORAP in 2009, and extended to incorporate subsequent research focusing on aspects of price and general economic instability in the region.

The study aims to increase understanding of: (a) the impact on economies and households of the first food price spike of 2007/08 – which was widely described as the 'food price crisis' – as well as the global financial and economic crises (b) the nature, outcomes and effectiveness of particular policy responses; (c) the agricultural and food security challenges confronting each country; (d) the extent to which immediate and longer term food security issues were addressed in programmes undertaken to cope with the impact of the financial and economic crises; and (e) the lessons that have emerged for country policies, as well as for regional and global cooperation to meet food security challenges.

The countries in the study have many shared characteristics as well as striking differences in such attributes as the size of population and economy, stage of development, trade dependency, status as a net food exporter or importer and availability of international reserves. China and India are clearly the two 'giant' economies of developing Asia, whose exports and imports of staple cereal grains are essentially residuals reflecting relatively small domestic supply/demand gaps. In recent years Indonesia and Philippines have been the two largest importers of rice. Thailand and Vietnam share similarities in terms of population size, trade dependency and being large net food exporters. But they have very different levels of per capita income. Bangladesh and Cambodia are similar in their low income levels and in their high dependence for export earnings on garments. But Bangladesh has a much larger population and is a net food importer, while Cambodia is now a significant rice exporter. Nepal and Sri Lanka have smaller populations and both have confronted issues of internal conflict and post-conflict recovery during the study period, but they are different in terms of per capita income, socio-economic indicators, economic structure and the role and importance of international trade. Importantly, Nepal is a land-locked country which has a long and porous border with India while Sri Lanka is an island nation.

The food price surge of 2007/08 came as a big and unexpected shock to Asia, even allowing for the fact that international price increases denominated in terms of US dollars exaggerated the actual extent of international price increases for many Asian countries, whose currencies had substantially appreciated against the US dollar. One reason why the 2007/08 price hike was such a big shock was because during the previous two decades real prices had fallen, and there was unusually low price volatility around the declining trend. Many national governments and the international community appeared to have forgotten that this benign outcome was the result of the huge global effort that went into enhancing food production after the crisis years of the 1970s.

The food crisis encouraged governments to emphasize food production and productivity, and in many countries some public assistance was provided to poorer households affected by high prices.

The immediate measures adopted by governments were aimed at insulating domestic food prices from the international price surge. While the package of policy responses varied from country to country, every one of them used – or was prepared to use – trade policy interventions of one sort or another. Indeed, trade policy interventions were the primary form of intervention and were by and large quite effective in substantially stabilizing domestic prices in most countries. Though each country had a package of policy measures which differed from each other, there was one common thread that linked all of them, with the sole exception of Thailand: the abandonment of liberal trade policy.

Unfortunately, imposition of such trade restrictive policies by exporters (aimed at stabilizing domestic prices) led to even higher international prices, thereby further aggravating food insecurity in net importer countries and inflicting long-term damage to the international food trading system. The maintenance of long-term restrictions to international trade in food, particularly non-tariff barriers, though helping to avoid the

impact of sharp but short-lived price increases, can result in 'permanently' higher food insecurity for large groups of households.

The first food price crisis occurred during a period of rapid and robust global and Asian-region economic growth and therefore no major domestic supply shocks occurred in any of the major Asian countries during this period. Rapid economic growth meant higher household incomes and faster poverty alleviation, and enhanced the ability of households to cope with food price increases. Strong growth in the previous period, the vibrant global economic environment, and general optimism about future growth prospects gave governments greater fiscal capacity to assist affected households and shield them from the full impact of higher international food prices. But without strong policy responses, the outcomes could have been far less benign.

Though the region as a whole did not experience a major deterioration in overall food security, not all households were immune from the impact of high food prices. Poorer households, with very limited access to savings or credit markets, are especially vulnerable to sudden swings in prices, particularly food price increases, and the evidence suggests that some of the poorer households experienced higher food insecurity. But, as shown in the case of Thailand, high food prices did not always increase overall poverty.

The global financial and economic crises had a strong impact on Asian economies, with the more open economies being worst affected, and developing Asian economies went through a period of increasing and sometimes quite acute economic distress. Fortunately, this period of severe stress was of relatively short duration and the region as a whole made a remarkably quick and strong recovery and averted the feared sharp increase in poverty and food insecurity. Government stimulus programmes, with China in the lead, played an important role by ensuring that aggregate demand, employment and incomes were at least partially restored after the initial slump.

More generally, extra spending to cope with the food price crisis and on stimulus programmes has led to a general deterioration of government fiscal balances in most Asian countries and an increase in public debt. In this situation, with weaker fiscal positions, Asian countries will face even greater challenges in the event of a serious international economic downturn and/or new shocks threatening food security.

It is clear that each country should review the set of policy instruments available to cope with food security in a context of high and volatile international price setting to develop strategies to cope with unanticipated shocks, whether of internal or external origin.
A key policy message from our study is the imperative and urgent need to reverse the underinvestment in food and agriculture.

The continuing food price pressures are a signal of tight supply/demand conditions in global food markets; in tight markets, where demand is very inelastic, relatively minor shocks can produce sharp spikes and high volatility. Long-term imbalances and periodic sharp price spikes are inevitable unless production increases can keep pace with projected demand increases from both higher global population and higher incomes. The world cannot afford to be complacent about food production.

Another policy message is the need to have a set of policies in place that can reduce the volatility in food prices, while coping with shocks that will occur from time to time. The realistic challenge is to design policies and measures to reduce and manage volatility, rather than seek to eliminate it because volatility in food markets is nothing new and will never disappear

It is important to recognize the huge global value of a stable and reliable international food trading system, both for efficient global food production and distribution and as a major source of global food security. But it is unrealistic to expect national governments not to resort to trade restrictions in emergency situations if they do not have other effective policy tools to deal with food price volatility. This may require more careful exploration of so-called second-best trade policy options.

Policies should be designed to strengthen, not undermine, long-term incentives for food production and the international food trading system in pursuing national food security goals. In this context, well-designed safety nets can provide food security for vulnerable groups when required, without the undesirable effects of trade restrictions, price controls or across-the board consumer subsidies. National and regional emergency reserves, buffer stocks and other public storage systems should be designed bearing in mind that, to achieve efficient stabilization, public storage must complement private storage, rather than supplant it.

Based on our analyses of the Asian experience coping with recent food price and global economic shocks, we submit the following recommendations for consideration by national governments, international agencies and policy analysts:

Recommendation 1:

We recommend that national governments and the international community formulate strategies to increase food production by re-ordering investment priorities to allocate public investment to agriculture, undertaking policy reforms to eliminate policy distortions that distort incentives away from agriculture, and establishing a policy and institutional environment conducive to attracting both domestic and foreign private investment into agriculture.

Recommendation 2:

We recommend that all countries take steps to set up efficient, targeted safety net schemes to meet the needs of vulnerable groups, particularly when faced with sudden and unexpected shocks to food prices. Where safety net schemes already exist, we urge countries to review their operations, scope and effectiveness and undertake measures to ensure that their coverage and funding is adequate to meet food security needs during crises and shocks.

Recommendation 3:

We recommend that regional and sub-regional initiatives be pursued to explore the potential for effective stabilization measures through combinations of publicly-managed buffer stocks and market mechanisms such as futures markets.

Recommendation 4:

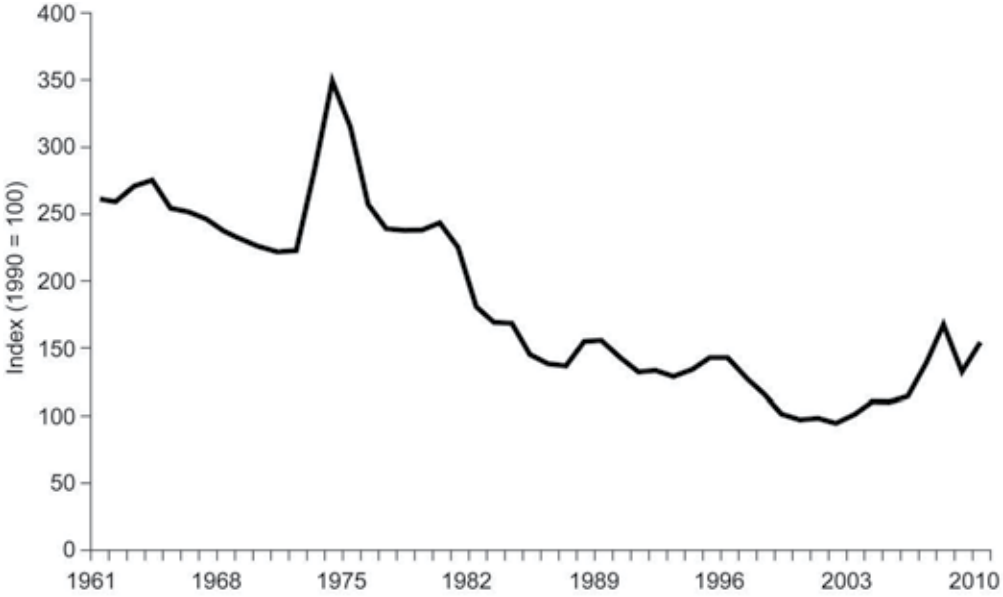
We recommend that research be undertaken on how to achieve national goals of food security and internal price stability in the presence of high volatility in international prices while maintaining and strengthening the integrity of the international trading system. In this context, the costs and benefits of 'second-best' options such as variable trade taxes should be explored, while recognizing concerns about export taxes on agricultural trade that may be used to tax agricultural producers and aggravate existing policy distortions against agriculture.

1. Introduction

After two decades of relative stability and gradually declining real food prices, the first decade of the twenty-first century has been marked by a combination of high and volatile prices not seen since the 1970s (Figures 1 and 2) and turbulence in the global economy, worse than anything seen since the 1930s.[1] While volatility in agricultural markets is nothing new, this combination of high and volatile prices during a period of grave instability in the global economy is raising serious challenges for the maintenance of global food security.

Since 2007 there have been two big price shocks in international food markets: prices rose suddenly and sharply in late 2007 through early 2008, fell (though not to pre-2007 levels) in the aftermath of the global financial and economic crisis of 2008, and rose again in 2010. These two price spikes, in the context of continuing instability in the global economy since 2008, have brought into sharp relief the fragility of the global food situation and exposed serious weaknesses in the international food trading system.

Figure 1: Real international food price (1990=100): 1961-2010

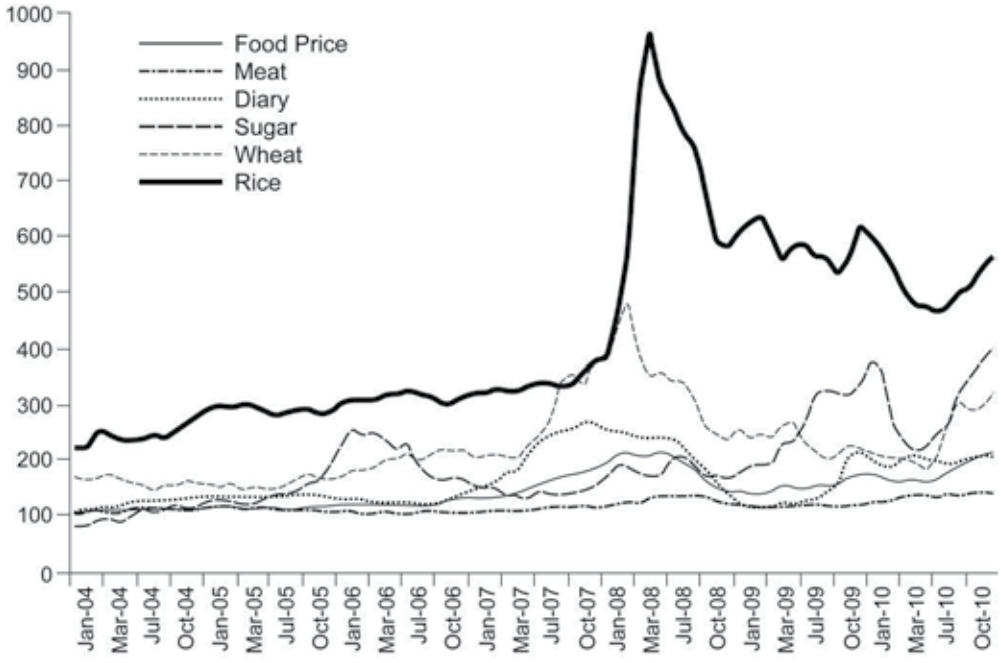


Notes: Calculated using international prices for cereals, oilseeds, meats, dairy products and sugar. The FAO Food Price Index is calculated from 1990 to the present on a regular basis; in this figure it has been extended back to 1961 using proxy price information. The index measures movements in international prices and not necessarily domestic prices. The United States GDP deflator is used to express the Food Price Index in real rather than nominal terms.

Source: FAO (2011d)

[1] According to the *Interagency Report* (FAO, 2011c, p.7),"When looked at in the long term there is little or no evidence that volatility in international agricultural commodity prices, as measured using standard statistical measures, is increasing and this finding applies to both nominal and real prices. Volatility has, however, been higher during the decade since 2000 than during the previous two decades and this is also the case of wheat and rice prices in the most recent years (2006-2010) compared to the nineteen seventies."

Figure 2: Monthly food commodity price indices (2002 to 2004=100)



Source: FAO (2011c)

As the FAO publication, *The State of Food Insecurity in the World: how does price volatility affect domestic economies and food security?* (2011, p.11) pointed out, the era of low prices appears to be over, and high and volatile food prices seem likely to be a long-term phenomenon: "…demand from consumers in rapidly growing economies will increase, population continues to grow, and any further growth in biofuels will place additional demands on the food system. On the supply side, there are challenges due to increasingly scarce natural resources in some regions, as well as declining rates of yield growth for some commodities. Food price volatility may increase due to stronger linkages between agricultural and energy markets, as well as an increased frequency of weather shocks."

This poses particularly serious threats to food security because it comes at a time of enormous instability in the global economy. Though the world managed to avoid a catastrophic economic downturn after the global financial crisis of 2008, ongoing turmoil in the Eurozone, continuing instability in global financial markets, and the deep fiscal problems plaguing the key advanced economies are reminders of the fragility of the global economy in the aftermath of the global financial crisis. As the International Monetary Fund (IMF) pointed out in the *World Economic Outlook September 2011,* "The global economy is in a dangerous new phase. Global activity has weakened and become more uneven, confidence has fallen sharply recently, and downside risks are growing" (2011a, p. XV). Recent developments in the Eurozone region and signs of weaker growth in China and India suggest that prospects of an early return to stability and sustainable growth have dimmed.

This combination of high food prices and high price instability (or volatility) poses dangers to food security in a multiplicity of ways.[2] Large price fluctuations, even around a stable trend,

[2] see FAO (2011), *The State of Food Insecurity in the World: how does price volatility affect domestic economies and food security?*, and the Interagency report to the G20 on Food Price Volatility – referred to hereafter as the *Interagency Report* (available on:

impose significant costs on consumers, producers and governments, particularly if they face liquidity constraints – as is typically the case in developing countries.

High prices and high volatility are often related; price volatility is generally higher during periods of high prices because of underlying tightness in supply and demand conditions when both supply and demand are relatively insensitive to price changes in the short term. In such situations even minor supply or demand 'shocks' can have large price effects. At a country level, high food price volatility has negative macroeconomic effects on both net exporter and net importer developing countries. Sudden price spikes produce balance of payments problems for importer countries, weaken public finances (as meeting food security imposes large import and subsidy costs), create inflationary pressures and reduce economic growth. On the other hand, sudden price falls produce balance of payments problems for net exporters, weaken government finances, reduce incentives for long-term investments in food production and generally constrain long-term growth.

Poor consumers, who spend the bulk of their income on food, are severely affected; not only is immediate food consumption affected, particularly for children and women, but there are longer term effects on children's nutrition and growth potential and investments in education and health. High prices are obviously good for producers, but sudden price swings expose them to severe hardships and reduce incentives for investments, including investments in productivity- enhancing technologies. High and volatile food prices are particularly damaging when they occur in a period of broader economic instability and shocks that threaten employment and incomes.

Asia, which has the largest numbers of poor and food-insecure people in the world, was affected directly and severely by the two recent food price spikes as well as by the global financial and economic crisis. But Asian countries, to their credit, averted the feared increases in food insecurity and severe aggravation of poverty that were predicted (and feared) by economic modellers, analysts and international agencies through aggressive and concerted policy action. Indeed, Asia's success in coping with the 2007/08 food crisis, the global financial and economic crisis and subsequently with the 2010/11 price spike has been so impressive in comparative terms that in looking back at the period – particularly the 2007-2009 period – some analysts have questioned whether there was a food security crisis at all.[3]

As we describe in more detail later, this outcome was a result of strong government action to ensure that high volatility in international food prices was not transmitted to domestic markets. The common thread that ran through the policy responses of Asian governments was the desire to reduce the transmission of international volatility to internal food markets, although different combinations of policies – trade policy measures, utilization of domestic stocks, public distribution systems and social safety nets – were adopted by different countries. While these measures were not always fully successful and not all countries were able to achieve the desired degree of internal price stability, by and large, the Asian region was able to record a remarkable degree of success in this endeavour.

However, Asia's success came at a price; these policies imposed very substantial short-term and long-term costs on governments, households and the international food trading system. Many importing countries were forced to devote heavy resources to stabilizing domestic prices through subsidized imports. Many exporters reduced or stopped all exports in order to stabilize domestic prices and built up large domestic stocks, but this increased international price volatility and weakened the food trading system. In addition, the large government

---

http://www.fao.org/fileadmin/templates/est/Volatility/Interagency_Report_to_the_G20_on_Food_Price_Volatility.pdf.) for a more detailed discussion.

[3] See the discussion in HLPE (2011, section 3.3) and Headey (2011)

expenditure programmes undertaken to cope with the global recession further weakened government budgetary positions, making them more vulnerable to future shocks.

The experiences of Asian developing countries that confronted these multiple shocks and crises in recent years are an important source of policy lessons and guidance, and provide a fuller understanding of the specific circumstances and current challenges facing these countries. But this Asian experience, including that of the most populous countries of the world, such as China, India, Indonesia and Bangladesh, has been insufficiently studied (Headey, 2011).

This study is a contribution towards filling this gap. It draws on analyses of the country experiences, based on a comparative regional study involving detailed, in-depth case studies of Bangladesh, Cambodia, China, India, Indonesia, Nepal, Philippines, Sri Lanka, Thailand and Vietnam, initiated by the FAORAP in 2009, and extended to incorporate subsequent research focusing on aspects of price and general economic instability in the region.[4] The country studies were aimed at understanding the following issues: (a) the impact on economies and households of the first food price spike of 2007/08 – which was widely described as the 'food price crisis' – as well as the global financial and economic crises; (b) the nature, outcomes and effectiveness of particular policy responses; (c) what agricultural and food security challenges were confronted by each country; (d) the extent to which immediate and longer term food security issues were addressed in the programmes undertaken to cope with the impact of the financial and economic crises; and (e) the lessons that have emerged for country policies as well as for regional and global cooperation to meet food security challenges.

The comparative dimensions of the study enabled the emergence of some important thematic and regional issues related to handling food price shocks as well as broader macroeconomic shocks. At the same time, the case study approach can highlight important, sometimes critical, country-specific factors which are often 'lost' in broader cross-country studies. This study also presents: (a) some survey-based evidence on the impact of high food prices on poverty and food security in some of the study countries; and (b) a deeper analysis of price transmission between international and domestic food markets, demonstrating the need to recognize the policy-induced dependence of this relationship on international price levels in analysis and forecasting to avoid overestimation biases in analytical modelling.

The structure of this report is as follows. The next section provides an overview and background of the 2007/08 food price spike (the 'Food Price Crisis'), the global financial and economic crises of 2008/09, and the second price hike in 2010/11. Section III provides a summary of the major research objectives and issues, and outlines the methodological approach. Section IV provides information on the major attributes and selected economic variables of the study countries, and how we have classified the countries into some broad groupings. In section V, the impact of the food price crisis on the study countries, policy responses and overall outcomes in terms of food security are described, with particular attention to government policies which attempted to insulate domestic markets from the impact of international food price increases. It also discusses how some national trade policy responses led to a weakening of the international food trading system. The impact of the

[4] The analysis here has been recently updated to take into account some of the recent important developments. The original study plan envisaged wider country coverage but due to unexpected personal issues faced by some of the selected country authors, the study was confined to these countries. The project methodology and approach was discussed and agreed on at a planning workshop held on 12-13 October 2009 at the FAO-Regional Office in Bangkok, Thailand. Preliminary study findings, except for the Philippines study, were discussed at a subsequent workshop on 23-24 February 2010 prior to finalization of country studies and a draft synthesis report was presented in Beijing in 18-19 November 2010. The Philippines component of the study was completed in December 2011.

global financial and economic crises on the study countries is described and analysed in Section V1, and the impact of government policy responses on both short-term and longer-term food security are discussed. In section VII, policy responses of the countries are discussed in a comparative setting, with particular attention to how policy responses and outcomes were shaped by initial conditions and economic structure of the countries. The final section sets out some conclusions and recommendations.[5]

2. Background: food price spike of 2007/08 and the global financial and economic crises

When global food prices started to rise quite rapidly in 2006, they initially appeared to be simply catching up with other commodity prices already experiencing a boom. But prices rose very sharply in late 2007 and by the first half of 2008 food prices were increasing much faster than other commodity prices. International rice prices, for example, were three times higher (in US dollar terms) in late May 2008 than in May 2007. Though prices denominated in US dollar terms exaggerated the actual increase of international prices for many Asian countries, whose currencies had substantially appreciated against the US dollar, the international price increases were nevertheless very steep.[6]

This sharp and unexpected spike in food prices – the food price crisis – occurred after a long period of secular decline starting from the mid-1970s. It came as a shock to most national governments and the wider international community. It raised international concern over global food security and its socio-political consequences, and stimulated a surge in analytical research and policy interest into the causes and potential solutions. As a result, we are now able to access a large body of new research into the immediate and longer-term causes of the food price crisis which has documented and analysed the policies, as well as some of the weaknesses and failures, of national governments, international organizations and the global community.[7]

This research has quantified the nature and extent of international food price volatility and identified many factors, both long-term and short-term, that contributed to the food price crisis and the aggravation of instability in food markets. A series of publications by the Food and Agriculture Organization of the United Nations (FAO), including the *Interagency Report* (FAO, 2011c), and the *Report on Price Volatility and Food Security* by the High Level Panel of Experts on Food Security and Nutrition (HLPE, 2011) provide overviews of this literature, presenting a discussion based on three interlinked explanations relating to short-, medium-, and long-term factors.[8] In considering the 2007/08 price spike, there is a consensus that a number of unanticipated factors came together in a situation where longer-term factors had

[5] Some of the key recommendations that were discussed in Beijing in November 2010 and incorporated in a draft synthesis report prepared in December 2010 anticipated and are consistent with recommendations in the Interagency Report and the recent HLPE report (HLPE, 2011).

[6] The magnitude of the price movement varies with the currency in which international prices are measured and part of the sharp increase in US dollar-denominated price was simply a reflection of the weaknesses of the US dollar relative to other currencies, including Asian currencies.

[7] See, for example, Dawe (2010), Headey (2011a and 2011b), HLPE (2011), Prakash (2011), and earlier studies in the special issue of *Agricultural Economics* (vol 38, 2008), Alexandratos (2008), FAO (2008), Timmer (2008). For a useful general discussion of the impact of the global financial and economic crisis on agriculture and food, see Lin and Martin (2010).

[8] Baffes and Haniotis (2010) provide an overview of the factors driving the global commodity boom during 2006-2008, while Headey and Fan (2008) provide a useful summary of the various explanations for the food price crisis and offer a critical review of their strengths and weaknesses. Headey (2011a) highlights the role of trade shocks.

produced a general tightening of supply and demand conditions to create a sudden and sharp price spike. Wright (2009, p. iv) summarized these as follows:

"Among the more **persistent changes** that set the stage for the grain price spikes of 2007-2008 were sustained rapid increases in income in many countries, including China and India, which increased grain demand, especially for animal feeds. Public support for biofuel production was a large and persistent shifter of demand for maize and oilseeds, *whereas funding of production-oriented crops research was neglected (emphasis added)*. By 2007, these factors could hardly have been surprises that could cause prices to jump. Their net effect was rather a progressive tightening of the aggregate supply/demand balance for major grains in the preceding years.

Unpredictable factors in 2006–2008 included the boost in biofuel production beyond planned levels, induced by a spike in petroleum prices, the unprecedented extension of the multi-year Australian drought, other regional production problems, transport cost increases and exchange rate movements, all of which contributed to price rises in global market made vulnerable by lack of stocks. Finally, the **sequence of export controls**, taxes and bans adopted by key exporters beginning in the thin global rice market in the fall of 2007, initially in response to consumer concerns about wheat supplies, **turned market anxiety into panic"** (emphasis in the original).[9]

An additional factor that has attracted considerable attention has been the role of speculators. In the popular press much of the blame for the price spike is laid at the door of speculators.[10] This is a complex issue; in principle, speculative activities in markets can be stabilizing or destabilizing. There is certainly evidence in recent times of substantial increases in speculator activity in food markets. But there is no consensus about the extent to which speculation in commodity markets has contributed to the price spike (see HLPE, 2011, Gilbert, 2010, several papers in Prakash, 2011, Rose, 2010, Wright, 2009).

The sharp escalation of food prices generated fears of a severe worsening of poverty and global food insecurity. Because the poor, even in rural areas, are mostly net food buyers, typically spending half or more of their income on food, any sudden, large increase in food prices cuts real incomes of the poor and produces a sharp deterioration of food security. If households had to cope with the levels of international food price increases, many households – estimates varied from 60 to 160 million globally – would have been pushed below the poverty line.[11]

But the view that high food prices are always anti-poor has been challenged. Some analysts have argued that in countries with large rural populations, high food prices may in fact be pro-poor: given that most poor people, though net buyers of food, live in rural areas and obtain a large part of their income directly or indirectly from agriculture, higher food prices may raise rural incomes enough to more than offset the food price impact.[12]

Arguably, in one sense the food price crisis had an important positive effect: it jolted the world into recognizing the need to redress the long-term neglect of agriculture. For too long the international community appeared to have forgotten that the favourable food situation and falling real prices could not go on forever without substantial new investment. With the onset

[9] Headey (2011a) also emphasizes the importance of short-run trade shocks in generating the sharp price spike of 2007/08, pointing out that the slow-moving longer-term pressures "can eventually result in trade actions that can turn a tighter world food system into a state of full-blown crisis." (p. 146).
[10] See, for example, the widely-cited article by Frederick Kaufman in Harper's Magazine (2010), "The Food Bubble: how Wall Street starved millions and got away with it"
[11] See Headey (2011) for a review of these studies.
[12] See, for example, Aksoy and Isik-Dikmelik (2008), Polaski *et al*. (2008)

of the food price crisis, food security and agricultural development again became priority areas for global policy and investment allocation. The eruption of the global financial crisis in the second half of 2008 weakened this favourable policy shift but did not totally reverse it, and the importance of food security was reinforced by the second price spike in 2010/11.[13]

The background to the global financial crisis is well known and is only very briefly summarized here. In September 2007, when financial institutions in the United States of America were already grappling with problems related to sub-prime housing loans, the international financial system was suddenly plunged into deep crisis following the default by Lehman Brothers, the long-established major US investment. This produced a collapse of confidence in financial institutions, severe credit crunch in capital markets, massive falls in equity and other asset markets. In the United States of America and Western Europe, governments intervened on a massive scale to rescue several other leading international banks and other financial institutions.

In April 2009, the IMF (2009a) in the *World Economic Outlook 2009* (p. 3) described the situation as follows: "Sharp falls in equity markets as well as continuing deflation of housing bubbles have led to a massive loss of household wealth. In part, these developments reflected the inevitable adjustments to correct past excesses and technological failures akin to those that triggered the bursting of the dot-com bubble. However, because the excesses and failures were at the core of the banking system, the ramifications were quickly transmitted to all sectors and countries of the global economy. Moreover, the scale of the blows has been greatly magnified by the collapse of business and consumer confidence in the face of rising doubts about economic prospects and continuing uncertainty about policy responses." A long and sustained period of global economic growth was not only brought to a sudden halt but also exposed as being based on unsustainable credit expansion and financial manipulation.

The impact on Asian economies was immediate and severe. The Asian Development Bank described the situation as follows in April 2009 in *The Global Economic Crisis: Challenges for Developing Asia and ADB's Response* (p. 2): "The global financial crisis presents developing Asia with its most difficult economic challenges in recent times. Growth rates have fallen sharply and are projected to drop further. Unemployment, deprivation, and financial and fiscal stress have increased and will likely worsen. Poverty reduction and other key development efforts have been knocked off track. As the economic fallout from the financial crisis that began in the United States of America became worldwide, overall growth in developing Asia tumbled from its impressive peak of 11.5% in 2007 to 6.3% in 2008. In 2009, the *Asian Development Outlook* sees another steep fall, to only 3.4%."

The expected slowdown in economic growth was widely expected to deal a serious blow to poverty alleviation, significantly increasing food insecurity. Hasan, Magsombol and Cain (2009), examining the impact of a slowdown in growth rates on poverty in developing Asia, concluded that "a reduction in growth of GDP per capita of 3 percentage points over growth registered in 2007 – a year of high growth for many Asian developing countries – would result in almost 61 million additional $1.25/day poor in 2009 and 98 million additional poor in 2010 as compared to a baseline scenario of no economic slowdown."

In a similar vein, Chen and Ravallion (2009) estimated that "that the crisis will add 53 million people to the 2009 count of the number of people living below $1.25 a day and 64 million to the count of the number of people living under $2 a day. Given current growth projections for

[13] We do not discuss in any detail here the nature, causes or the broader aspects of the 2008 global financial crisis and the subsequent global economic crisis in 2009. The literature on the subject is already large and rapidly growing. For an introductory overview of the emergence and evolution of the crisis, see IMF (2009a) *World Economic Outlook 2009* and IMF (2010a) *World Economic Outlook 2010*.

2010, there will be a further impact on poverty in that year, with the cumulative impacts rising to an extra 73 million people living under $1.25 a day and 91 million more under $2 a day by 2010." A study by the US Department of Agriculture Research Service (Shapouri *et al*., 2009) estimated that the economic crisis would increase the food-insecure population of the world by about 9 percent in 2009, bringing the number of undernourished people to over one billion. This number was widely cited, including by international agencies such as the FAO (2009).

However, the feared worst case scenarios of large increases in poverty and food insecurity did not come to pass, at least in Asia, and there is now debate over whether these shocks had any serious negative impact at all. Understanding why and how Asian countries avoided a catastrophic deterioration in food security during this period is important for preparing to confront the new challenges that lie ahead. We discuss these experiences in detail in subsequent sections, but note here that government actions played a central role in ensuring that food insecurity did not increase dramatically as projected. .

3. Research issues, approach and methodology

In this section we briefly outline the key research issues, framework and methodological approach adopted in the country studies.

The primary aim of the country case studies was to investigate the nexus between food security, agriculture and the various international shocks to provide a rigorous and policy-oriented analysis of the impact of such shocks on food security in Asia and to synthesize policy lessons and recommendations to deal with such crises in the future. Given that the global financial and economic crisis came on the heels of the food price crisis of 2007/08, it was recognized that the analysis of the impact of the financial and economic crisis and the policy implications had to be linked to the short- term as well as longer-term food security related issues highlighted by the food price crisis.

The project aimed to assess each country's policy responses in the context of the specific economic and social structure of each country and the policy space and options available to governments, and to evaluate their effectiveness in relation to longer-term regional and global food security goals. It was hoped that the studies would also identify ways in which cooperative regional or global initiatives can help improve both national and global food security.

Food price spikes as well as the global financial and economic crises are 'external shocks' originating in international markets which have an impact on the national economies. They coincided with several other shocks, in particular the oil price shock and wider commodity price boom.[14] In analysing the impact of a shock it is necessary to identify the channels through which an external shock is transmitted to each national economy, estimate the magnitude and outcomes of the shock, and examine the impact of policy measures and market structures on the extent to which an external shock is transmitted – or 'passed through' – to internal markets and households.

It is also important to distinguish between 'temporary' (short duration) and 'permanent' (long duration) shocks, as responses and policies can be quite different depending on the expected duration of a shock. Whether a shock is 'temporary' or 'permanent' (long duration) has both positive and normative implications. Standard economic theory suggests that while optimally

[14] For a useful introduction to approaches to analysing how countries respond to exogenous shocks, see Little *et al*.(1993) but note that there is a very large and continually growing theoretical and empirical body of literature on this topic.

consumption should be 'smoothed' in response to a temporary shock, it must be 'adjusted' in response to a permanent shock by bringing expenditure back into balance with income.[15] But it is not always easy to judge the duration of a shock at the time a shock occurs and responses must be judged using information available at the time.

In the case of food prices, the 'shock' was the sharp, unanticipated price spike measured relative to the underlying longer upward term trend discernible from around 2002 and it was transmitted primarily through trade channels. The shock of the global financial and economic crises was multidimensional, affecting trade, capital and financial flows, as well as domestic investor and consumer confidence and was transmitted through multiple channels. Household incomes, food security, and living standards were affected by the changes in domestic factor and product prices and government policies.

How does a specific external shock affect the national economy? A country gains – i.e. its real national income goes up – if the price of its exports goes up; the opposite happens if the price of an imported good goes up. Hence a country is a net gainer from an improvement in its overall international terms of trade, usually defined as the relative price of exportables to importables.[16] Thus, a world food price increase, other prices remaining the same, implies a reduction in national income for net importers and an increase for net exporters. If the shock reduces national income, the country faces a tighter inter-temporal budget constraint and a reduction in expenditure (investment and/or consumption) by all agents (government, firms and households) is needed to maintain income/expenditure balance in an economy.

The impact of external shocks cannot be properly ascertained by simply looking at the observed outcomes; observed outcomes are the product of the interaction of exogenous shocks and endogenous responses of economic agents (government, firms and households). In order to properly assess the impact of the shock itself, it is necessary to have a counterfactual scenario as to how the economy would have performed if there had been no shock. This requires an analysis of the extent to which the shock has driven key economic variables, such as national income and employment, from the trajectories they would have taken if there had been no shock.

In principle, a well-specified model of the economy can generate such counterfactual scenarios and impacts of shocks and crises can be assessed against the counterfactual benchmark (see, for example, the World Bank study of the impact of the crisis by Lin and Martin (2010)). But such models are not always available and, even when available, are subject to important limitations.[17] To understand the complex evolution of shocks, responses

[15] In principle, a government can borrow and postpone adjustment if the shock is temporary.

[16] A widely used indicator of the impact of a shock or crisis is the observed change in real GDP of an economy. But this can be a misleading and inaccurate indicator. If international prices of imports have increased relative to export prices (i.e. if international terms of trade have moved against the country), then it is possible that its real income falls even if real GDP is unchanged or even if it increases. This is because real GDP measures the actual ('physical') output of goods and services produced in the country, but their value is measured at pre-crisis prices The real GDP, valued at so-called constant (i.e. pre-crisis) prices does not reflect the lower international purchasing power of its exports. In other words, the same (or even a larger) volume of domestically produced goods and services has a lower overall purchasing power – i.e. the country has a lower real income.

[17] These include, for example, the following, as noted on the website of the Global Trade Analysis Project (GTAP): "First, CGE simulations are not unconditional predictions but rather thought experiments about what the world would be like if the policy change had been operative in the assumed circumstances and year. The real world will doubtless have changed by the time we get there. Second, while CGE models are quantitative, they are not empirical in the sense of econometric modelling: they are basically theoretical, with limited possibilities for rigorous testing against experience. Third, conclusions about trade policy are very sensitive to the levels assumed for trade restrictions in the base data." (https://www.gtap.agecon.purdue.edu/models/cge_gtap_n.asp). Further, analysis of

and outcomes, such formal models should be used in conjunction with other, more detailed empirical data.

There is an important distinction between the impact of an external shock at the level of the national economy and its impact on specific sectors and 'agents' in the economy. In cases where the country is 'small' (i.e. not able to influence international prices)[18], it is forced to accept the direct income effect on the national economy. A government cannot prevent the country from experiencing the national income effect of an external shock but it can insulate the internal economy from experiencing the full effects of international price movements, at least partially and temporarily.

The impact of international shocks and resulting changes in national income at the producer and consumer levels depends on the nature and extent of price transmission of border prices to internal prices. If international trade is free (costless), and world and domestic markets are perfectly integrated, then identical goods will have identical prices in both markets (i.e. the 'Law of One Price' will hold); otherwise, domestic prices will diverge from international prices. Barriers to trade will produce divergences in price movements in different markets and break this link.

Once an external shock is passed through, fully or partially, to internal markets, market forces respond by changing production and consumption incentives and, over time, factor allocations and commodity outputs. These are associated with changes in factor incomes, such as levels of wages, returns to land, capital and other factors. In turn, new prices, outputs and patterns of income distribution emerge. Relative price changes in world markets, to the extent that they are transmitted to internal prices, alter resource allocation and income distribution. The pace and extent of such adjustments depend on a range of factors, including the extent to which factors (labour, capital, etc.) are able to move (are 'mobile') across different industries and sectors.

Policy responses to shocks are often designed to fully or partially insulate domestic markets and affected groups from external shocks and lower the extent of pass through to internal markets. But insulation of domestic markets through various policy measures does not mean that a country can avoid coping with the impact of the shock. [19] It simply means that the adjustment burden is *shifted*, not eliminated. For example, if the country is a net food importer facing a higher international food price, someone must bear the cost of financing a higher food import bill. If consumers are insulated through subsidized imports, then the cost will be shifted to the government (taxpayers).

In analysing large shocks, such as the global financial and economic crises, that have impacts extending beyond their immediate target, it is essential to recognize the interconnections between different sectors, industries and markets. The research approach therefore adopted an economy-wide, general equilibrium, *conceptual* framework. This meant that researchers approached the analysis with a holistic view of the economy, relating industry and sectoral impacts to the broader developments in goods and factor markets. In implementing the approach, country study authors used different combinations of formal models, including

---

macroeconomic shocks with computable general equilibrium (CGE) models has further limitations due to the fact that the core models are 'real' models. For many developing countries undergoing rapid structural changes, data limitations underpinning the basic CGE models can be quite severe.

[18] The term 'small country' is used to describe any country whose imports and exports are only a small part of supply and demand in global markets; changes in the level of imports or exports of that country have a negligibly small impact on prices in world markets, making the country a 'price taker' in world markets with no 'market power'.

[19] This may make sense where the change in relative price is expected to be transient and resource reallocation would incur large adjustment costs.

applied computable general equilibrium (CGE) models, and other analytical techniques, drawing on country-specific knowledge and informed judgement, in accordance with the specific country circumstances and priorities, data availability and their own expertise.

4. Study countries and classifications

Table 1 provides some macroeconomic indicators for the study countries: Bangladesh, Cambodia, China, India, Indonesia, the Philippines, Nepal, Sri Lanka, Thailand and Vietnam. They show the huge diversity among study countries in terms of major variables such as size of population, level of per capita income, trade dependency and structure of the economy.

Table 1: Selected indicators of the study countries

Country	Population (million) 2010	GDP per capita (current international dollars) 2010	Share of agriculture in GDP 2010	Percentage of population below $2 per day 2009	Exports as % of GDP 2009	Imports as % of GDP 2009	Total food trade as % of Total Trade 2009	Foreign reserves (months of imports) 2007	Foreign reserves (months of imports) 2010	Fiscal Balance % GDP 2007	Fiscal Balance % GDP 2008
Bangladesh	146.2	1677	18.8	81.3	19.4	26.6	11	4.1	6.3	-3.2	-5.9
Cambodia	14.3	2159	36.0	56.5	59.6	62.7	5	4.7	6.7	-0.5	-0.1
China	1339.7	7554	10.2	36.3	26.7	22.3	2	20.4	26.0	0.6	-0.4
India	1182.1	3535	19.0	75.6	19.6	24.0	4	12.8	12.5	-2.6	-5.9
Indonesia	234.2	4411	15.3	50.6	24.2	21.4	10	8.0	9.1	-1.3	-0.1
Nepal	28.3	1255	35.0	77.6	15.3	36.4	8	n.a.	0.2	-1.8	-2.1
Philippines	94.0	3923	12.3	45.0	36.9	39.4	6	5.6	12.3	-0.2	-0.9
Sri Lanka	20.7	5098	12.8	29.13	21.3	27.8	10	3.7	6.4	-6.9	-7.0
Thailand	67.3	8748	12.4	11.5	68.4	57.8	5	7.6	11.5	-1.3	-0.6
Vietnam	86.5	3193	20.6	38.4	68.3	78.7	8	3.8	3.1	-1.0	-1.9

Sources: (a) columns 2; 6-7; 9-12: ADB (2010, 2011), *Key Indicators for Asia and the Pacific*; (b) column 8: WTO (2010), *International Trade Statistics 2008*, and FAO (2010), FAOSTAT, 2007; (c) column 5: World Bank (2010a), *World Development Indicators 2010*; Data on poverty is as of 2005 for Bangladesh, China, India; 2004 for Nepal; 2006 for the Philippines; 2007 for Sri Lanka; 2008 for Vietnam and 2009 for Indonesia;(d) column 3: ADB (2010, 2011), *Key Indicators for Asia and the Pacific*

The study countries have many shared characteristics as well as striking differences in attributes such as size of population and economy, stage of development, trade dependency, status as a net food exporter or importer and availability of international reserves.

China and India are clearly the two 'giant' economies of developing Asia, though they also have striking differences in many aspects. Each has a population over one billion, rapid economic and export growth in recent years, comfortable foreign exchange reserves[20], and exports and imports of staple cereal grains which are essentially residuals reflecting (relatively small) domestic supply/demand gaps.

Indonesia, in some ways, is similar to these two much larger economies in terms of the importance of international trade in its main staple cereal, rice, and in its relatively high capacity to finance essential food imports, but it has a much smaller economy and a population similar to that of Bangladesh. The Philippines, though having a smaller population than Indonesia, is similar in terms of its income level and being a net importer of rice. In recent years Indonesia and the Philippines have been the two largest importers of rice. They

[20] India's external position, never as strong as China's, has deteriorated recently.

differ in the structure of their export earnings: primary product exports are very important in Indonesia, while the Philippines is heavily dependent on huge remittances from migrant workers.

Thailand and Vietnam share similarities in terms of population size, trade dependency and in being large net food exporters. But they are at very different levels of per capita income.

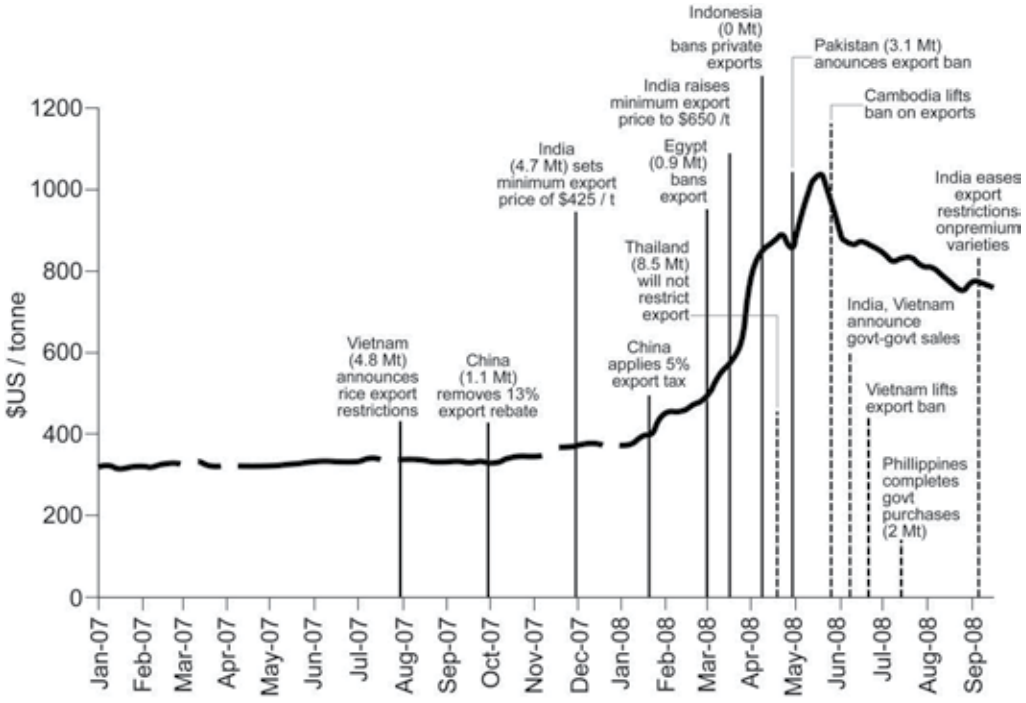
Bangladesh and Cambodia are similar in their low income levels and in their overwhelming dependence (around 75 percent) of export earnings on a single manufactured export, garments, most of which go to the US market. But Bangladesh has a much larger population and is a net food importer (though its import dependence has diminished in recent years) while Cambodia has become a rice exporter. They also share porous borders with larger neighbours: India with Bangladesh; Cambodia with Thailand and Vietnam.

Nepal and Sri Lanka are smaller countries by population size, and both confronted issues of internal conflict and post-conflict recovery during the study period. But they are substantially different in terms of per capita income, socio-economic indicators, economic structure and the role and importance of international trade. Importantly, Nepal is a land-locked country with a long and porous border with India, while Sri Lanka is an island nation.

All these countries have a high degree of self-sufficiency in rice, the major staple cereal. Even the Philippines, though currently the world's largest importer of rice, only imports about 10 percent of its requirement. Vietnam and Thailand are the world's largest exporters of rice. Wheat is also important in consumption, although wheat is not cultivated at all in Indonesia, the Philippines, Sri Lanka, Thailand and Vietnam, and cultivated only on a modest scale in Bangladesh. The two most populous countries, China and India, are largely self-sufficient in both rice and wheat and are marginal exporters (and importers) at times, though India has become a fairly consistent rice exporter in recent years. Overall the share of food – and of all agricultural products – in total trade is quite low across all countries, though China is one of the world's larger food trading countries.[21]

[21] See Ng and Aksoy (2009) for a discussion of the characteristics and extent of import dependence of net food importing countries. Some of the case study countries are not only importers of food but also exporters of several food and non-food agricultural products. For example, Indonesia and Thailand are also exporters of palm oil widely used for cooking in the region; Sri Lanka and India are large exporters of tea; the Philippines is a major exporter of coconut products. Both China and India are significant exporters as well as importers of a range of other food products, including cereals.

Figure 3: Trade policy changes, exports and the international price of rice



——— (solid vertical line) policy changes that reduce supply to international markets

------ (dotted vertical line) policy changes that should increase international supply

Source: IGC, USDA and media reporting

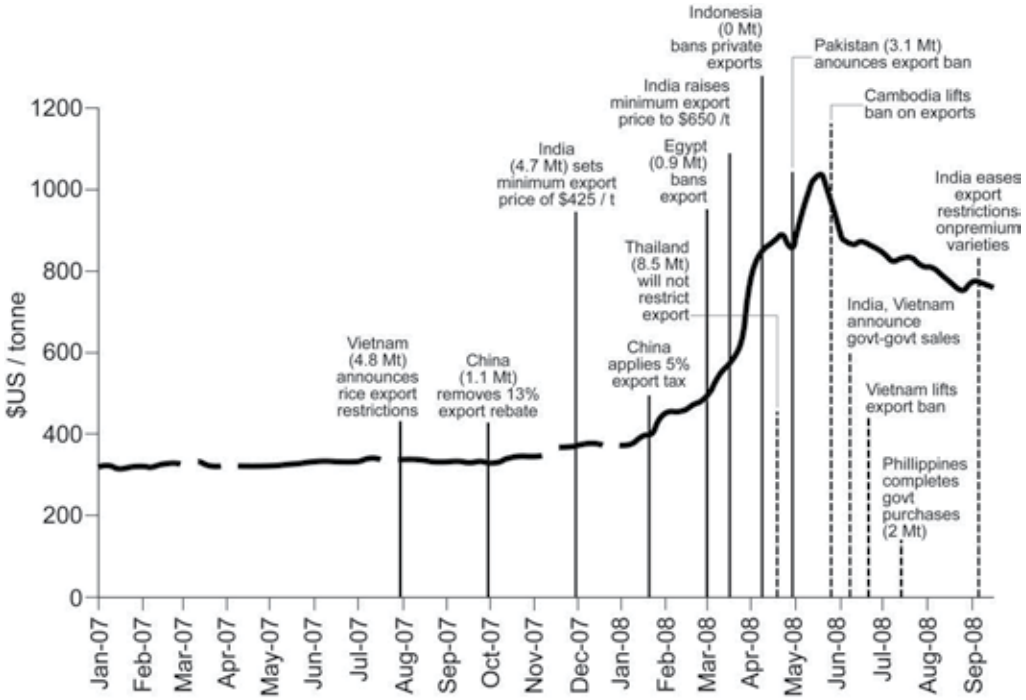
Notes:

1. Figures in brackets represent average annual exports. Country and global export volumes and production are based on average quantity in last 4 marketing years, USDA estimates.

2. Weekly price data, Thai 100% B grade, fob Bangkok. Source: FAO

Source: DFAT (2010)

Figure 4: Trade policy changes, exports and the international price of wheat



——— (solid vertical line) policy changes that reduce supply to international markets

------ (dotted vertical line) policy changes that should increase international supply

Source: IGC, USDA and media reporting

Notes:

1. Figures in brackets represent average annual exports. Country and global export volumes and production are based on average quantity in last 4 marketing years, USDA estimates.

2. Weekly price data, Thai 100% B grade, fob Bangkok. Source: FAO

Source: DFAT (2010)

Figures 3 and 4 which look at prices and shocks in international markets during the period of the first food price spike suggest that trade policies of the larger countries and major exporters or importers have a very substantial impact on international rice and wheat prices. Asia accounts for around 90 percent of global production and consumption of rice. Not surprisingly, Asian countries have significant market power and influence international prices. Given that international trade is only around 5 percent, the international rice market is very thin and susceptible to a high degree of volatility in response to even relatively small supply/demand shocks. Asian countries have a smaller presence in the international wheat market where sources of supply, as well as demand, are much more diversified. But India and China, who vary between being exporters and importers, have the capacity to move prices. [22]

[22] Headey (2011) discusses the interactions between rice and wheat markets, suggesting that wheat prices can have a strong impact on rice prices, rather than vice versa.

5. Impact of the food price crisis

Background to the first food price crisis: 2007/08

The 2007/08 food price crisis occurred during a period of generally favourable global economic conditions which had enabled most Asian developing countries to achieve high rates of economic growth and poverty alleviation (Table 2).[23] In contrast, the second price spike in 2010/11 occurred after the global financial and economic crises and, as seen in the world growth figures, in a more unstable global economic context.

Table 2: Annual GDP growth rates (% per year)

Country	2003	2004	2005	2006	2007	2008	2009	2010	2011 (proj)	2012 (proj)
Bangladesh	5.8	6.1	6.3	6.5	6.3	6.0	5.9	6.4	6.3	6.1
Cambodia	8.5	10.3	13.3	10.8	10.2	6.7	-2.0	6.0	6.7	6.5
China	10.0	10.1	11.3	12.7	14.2	9.6	9.2	10.3	9.5	9.0
India	6.9	7.6	9.0	9.5	10.0	6.7	6.8	10.1	7.8	7.5
Indonesia	4.8	5.0	5.7	5.5	6.3	6.0	4.6	6.1	6.4	6.3
Nepal	3.9	4.7	3.5	3.4	3.4	6.1	4.4	4.6	3.5	3.8
Philippines	5.0	6.7	4.8	5.2	6.6	4.2	1.1	7.6	4.7	4.9
Sri Lanka	5.9	5.4	6.2	7.7	6.8	6.0	3.5	8.0	7.0	6.5
Thailand	7.1	6.3	4.6	5.1	5.0	2.6	-2.4	7.8	3.5	4.8
Vietnam	7.3	7.8	8.4	8.2	8.5	6.3	5.3	6.8	5.8	6.3
WORLD	4.1	4.9	4.5	5.2	5.4	2.8	-0.6	5.3	3.9	3.5

Source: IMF (2011a), World Economic Outlook, Sept 2011

The two larger economies, China and India, both maintained impressive rates of growth through the period of the food price hike, with buoyant internal demand and rapid export growth. The remarkable export performance of China is well known. But it is worth noting that even in India's case, despite a mild deterioration of international terms of trade (a fall of around 5 percent, largely due to high energy prices), export growth was so strong that income terms of trade improved by over 50 percent during the period from 2003 to 2008. Cambodia and Vietnam also grew rapidly, with Vietnam inviting comparisons with China at an earlier stage. Indonesia recovered growth momentum after several years of political and economic turmoil, while Bangladesh emerged out of long years of economic stagnation, with exports growing rapidly (at over 16 percent annually in US dollar terms during 2003-2007), achieving current account surpluses and overall Gross Domestic Product (GDP) growth of over 6 percent. The Philippines had also started to show signs of having embarked on a path of sustained growth.

It is difficult to assess precisely the extent to which the food price increases would have affected the growth performance of the net food importing countries, partly because they were also affected by the high oil prices. But the fact that even low income importer countries like Bangladesh were able to maintain growth momentum during the food price crisis period does

[23] Note that Nepal, Sri Lanka and Thailand were all affected by political instability during this period.

not mean that international food price increases in world markets had no negative impact. It should be noted that growth was already slowing down in the Philippines in early 2008, prior to the global financial crisis, and food prices may have played a role.[24] But given the fact that food was a relatively small part of total trade and that the very high price spike was of quite short duration, it is unlikely to have had a very large effect.

But higher international food prices certainly imposed an added burden on net importer countries which aggravated the impact of oil price increases on the cost of imports.[25] Though food trade is a relatively small part of overall international trade, food constitutes a large share of household expenditures. In fact the food share is higher than that of energy in household budgets, so a similar food price increase has a larger impact on household expenditures than an oil price increase.

Table 3: Projected macroeconomic impact ofa 20% increase in food prices (over early 2008 price levels)

Macroeconomic Impact	Bangladesh	Cambodia	China	India	Indonesia	Nepal	Philippines	Sri Lanka	Thailand	Vietnam
Current account deficit as % of GDP										
Before	-0.7	-6.2	10.0	-3.4	1.2	0.2	1.0	-4.9	1.3	-11
After (projected 2009 position)	-1.1	-5.5	10.0	-3.3	1.1	0.0	0.9	-5.4	2.3	-10
Foreign reserves available for imports in months										
Before	2.4	2.9	17.6	10.1	6.0	6.0	5.2	2.6	5.8	2.3
After (projected 2009 position)	2.2	3.1	17.6	10.2	6.0	5.9	5.2	2.3	5.1	2.6

Source: IMF (2008)

An IMF (2008) modelling exercise indicated that if food and oil price increases had continued to 2009, Bangladesh and Sri Lanka would have been very seriously affected (Table 3). (The results of this exercise are somewhat questionable, however, as the Philippines would have been almost unaffected or even slightly favourably affected.)

Policy responses: staving off domestic price volatility and reversing global food market integration

Figures 5 to 15 depict the domestic and international rice price movements in international and domestic markets during the three shock periods (the first food price spike of 2007/08, the global financial and economic crisis, 2008/09, and the second food price spike of 2010/11).[26] The patterns for wheat are broadly similar but not identical. There are two important features of the figures that must be noted.

First, after the 2007 price hike, both international prices and domestic prices are generally significantly higher. Second, domestic prices are much more stable than international prices.

The much lower domestic price volatility is a direct result of policy responses during the crises, as we shall describe in the following sections. In general, price volatility can be generated by either domestic or international shocks. But during the study period, the primary

[24] The IMF (2009b), *Country Report for the Philippines* attributed it to "weaker external demand and consumption as the oil and food price shock reduced real income" (p. 4).

[25] In fact, the impact of high oil prices had a more severe negative impact than food price increases on every study country except Vietnam (IMF, 2008).

[26] The periods covered in the Figures for different countries differ and reflect data availability from the various sources. The domestic and foreign prices are expressed in terms of a single common currency, the US dollar.

shocks to domestic prices of the Asian countries originated in international markets.[27] Government measures insulated price movements in domestic food markets, particularly in rice and wheat, from those in international markets to varying degrees in all countries so that the international market volatility was not allowed to be fully reflected in internal price movements.[28]

While the policies that governments adopted to limit the transmission of international price spikes to domestic markets prevented an immediate sharp deterioration of food security in the Asian region, it must be noted that they had the effect of substantially reversing the gradual but significant agricultural trade liberalization that had occurred in Asia in the previous period.[29] During the pre-food price crisis period, domestic and international prices of the net exporters (Thailand and Vietnam, as well as Cambodia) generally tended to follow international price trends. The relationship was weaker in the net importer countries. But when international prices increased sharply, almost every country (including net exporters like Cambodia and Vietnam, with Thailand the only exception) attempted, with varying degrees of success, to keep domestic prices from following international movements by direct interventions in the international trade regime.

It is instructive to examine in some detail the evolution of policy settings during the first price spike as they have not been altered in any fundamental way since then, and have remained in place during the second food price spike of 2010/11.

The pattern of trade policy interventions evolved in response to the trajectory of international price increases in international markets, reflecting the specific country circumstances. Marginal net exporters, including the 'giants', China and India, first removed any export incentives already in place and went on to progressively restrict exports, finally imposing complete export bans as international prices continued to increase. Importers took measures to boost domestic supplies by releasing stocks, banning 'hoarding', relaxing import barriers (through custom duty reductions and waivers, removal of import licensing requirements, etc.) and, in some cases (e.g. the Philippines, Sri Lanka), financing subsidized imports.

Huang and Rozelle's (2010) description of how Chinese authorities reacted to increasing food prices provides a graphic description of the evolution of government trade policy interventions as international prices continued to rise. International trade in rice, wheat, maize and soybeans was largely unrestricted in China at the beginning of this period and domestic prices – especially in China's port cities – closely followed border prices. As international prices started to move up rapidly in 2007, the government's initial response was to release stocks from its rice, wheat and maize reserves that had been stored for use during natural disasters. Officials were then authorized to sign long-term futures and forward contracts with grain and meat trading firms in exporting countries.[30] But when the government realized that grain traders could exploit profitable arbitrage opportunities for exporting China's relatively low-priced food into global markets, it took steps to restrict such exports.

[27] We do not discuss here the impact of the floods in Thailand during late 2011 on domestic and international prices.

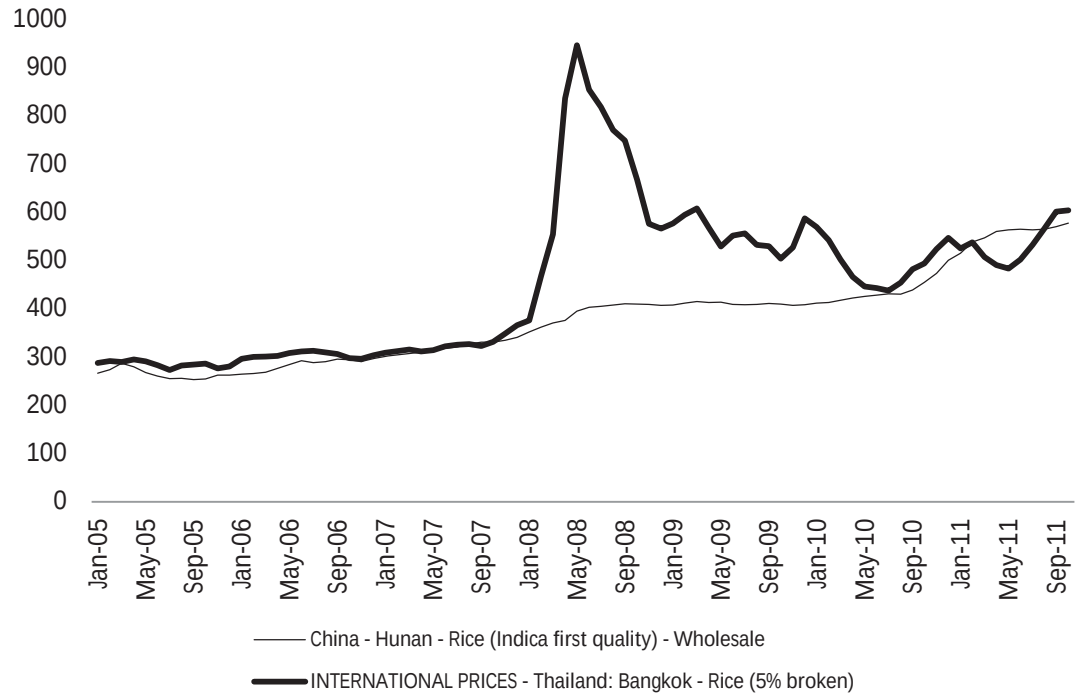
[28] Unless otherwise noted, country examples and discussions are based on the specific country studies. For descriptions of global policy responses to the food crisis at the time, see FAO (2008).

[29] For a discussion of the historical evolution of policies affecting the food and wider agricultural sectors, see Anderson and Martin (2009). Only Indonesia was an exception to this trend in recent years; following the transition to democracy, the government gave in to pro-farmer political pressure and after first imposing heavy tariffs on rice imports, officially banned imports altogether from 2004 onwards (although limited quantities of imports were occasionally permitted).

[30] Domestic concerns about higher pork prices triggered a policy response inside China to provide production subsidies (and insurance) to pork producers.

The first target was maize, which China had previously exported in quite large volumes. In November 2007, subsidies for storage and transport of maize destined for export markets were suspended. When this failed to keep prices from increasing through the first part of 2008, the government cancelled the payment of value-added tax (VAT) rebates, not only for maize but also for rice and wheat, as by this time it was becoming concerned about rice and wheat, the nation's two major food grains.[31] A month after the abolition of the VAT rebate, a 5 percent export levy was imposed on all export shipments, except those bound for Hong Kong, Taiwan and Macao. But even these steps were deemed inadequate to offset the continuing pressure from surging prices in international commodity markets. In early 2008, all exports of food and feed commodities were banned. Thus, between summer 2007 and March 2008, China "moved from subsidizing exports to assessing levies to imposing quantitative restrictions on exports" (Huang and Rozelle, 2010, p. 21).[32] With this combination of stock releases, export levies and quantitative export restrictions, China managed to effectively stabilize domestic prices (see Figure 5 for rice).

Figure 5: China: domestic vs. international price of rice, US$/tonne, January 2005 to October 2011



Source: Based on FAO price data: http://www.fao.org/giews/pricetool

Interestingly, China behaved quite differently in the case of soybeans, of which China is a large net importer (importing 60 percent of its domestic needs and representing 40 percent of global imports). It permitted more or less complete pass through of international price increases into the domestic market as the alternative was to incur a very large fiscal burden on subsidized imports.

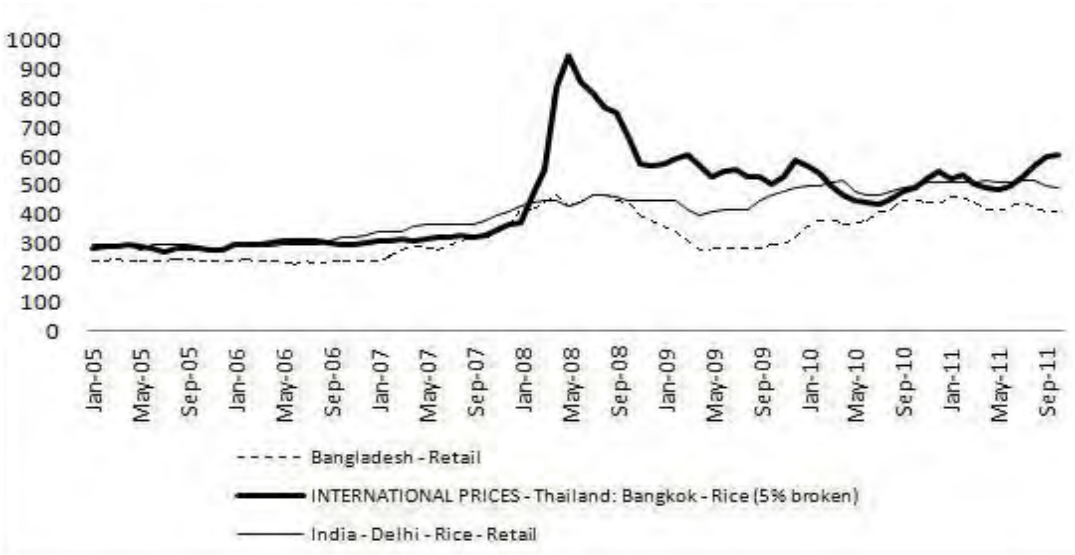
In the following discussion we focus on rice policies to highlight the common features and differences between policy responses of different countries.

[31] Other countries were adopting similar measures; on 29 January 2008, Russia levied a 40 percent export tax on wheat going to all nations other than those in its customs union (Dollive, 2008).

[32] The government also moved to restrict fertilizer exports from early 2008, again starting with export taxes that progressively increased to a level of 100% in May 2008.

Other marginal net exporter countries, such as India, acted in a similar way. Figures 6 and 7 highlight how Indian domestic rice prices, after fairly closely tracking the Thai price, did not follow it when international prices shot up, though they did edge upwards. In neighbouring Bangladesh and Nepal, it was the Indian price movements rather than international prices that exerted most influence on domestic prices. This was not surprising; for these countries who share long porous borders with India, it is the Indian market that is effectively the main 'international market'.[33]

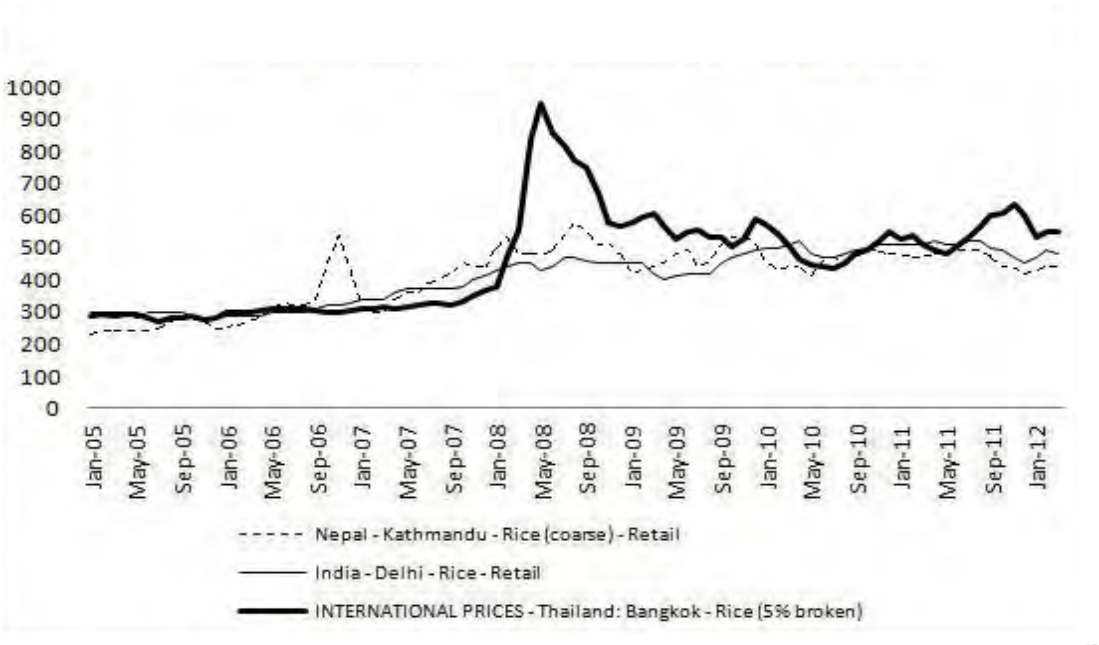
Figure 6: Comparison of domestic rice price (retail) in Bangladesh and India vs. international price, US$/tonne, January 2005 to October 2011



Source: Based on FAO price data: http://www.fao.org/giews/pricetool

[33] Indian-Nepali cross-border trade is largely free, in practice, and informal cross-border trade between Bangladesh and India is also large (See Taneja and Pohit, 2002, and Pohit and Taneja, 2003)

Figure 7: Comparison of domestic rice price in Nepal and India vs. international price, US$/tonne, January 2005to March 2012



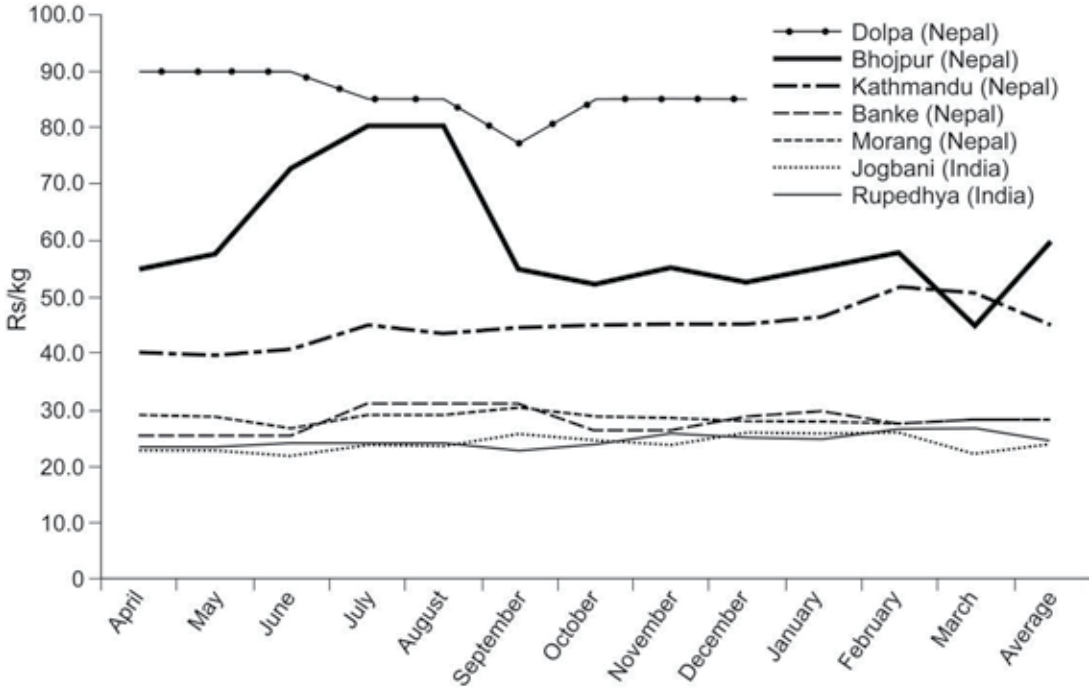
Source: Based on FAO price data: http://www.fao.org/giews/pricetool

In fact Nepalese food markets close to the Indian border appear more closely integrated with Indian markets than with Nepal's own interior markets (Figure 8).[34] Arguably, Indian policy measures not only stabilized India's own domestic price but also stabilized prices in Bangladesh and in border regions of Nepal.[35]

[34] Prices in Morang and Bankey markets in Nepal move closely with prices in their adjoining Jogabani and Rupedhya markets in India. But prices in Kathmandu and other interior markets such as Bhojpur and Dolpa are not so closely correlated.

[35] Internal price dispersion was high and market integration weak in Nepal due to high transport costs resulting from poor infrastructure.

Figure 8: Monthly price of medium rice in Nepal's selected markets and Indian bordering markets in 2008/09 (Rs/kg)



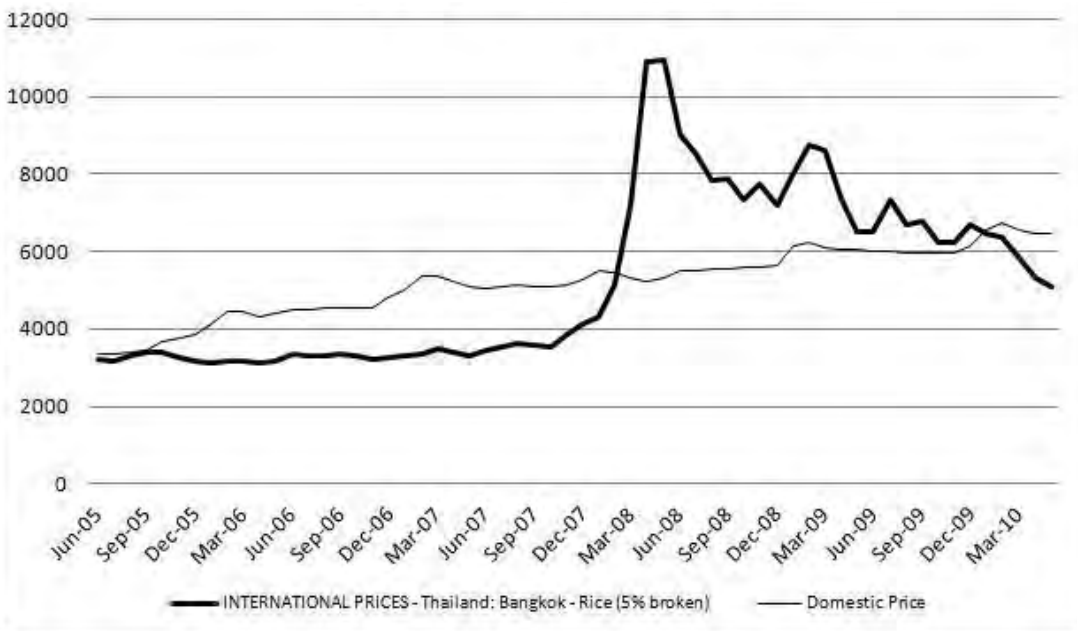
Source: Thapa and Kanal (2010), based on data sets of Agro-Business Promotion and Marketing Development Directorate, Nepal (2007 and 2009)

Indonesia, which had been the world's largest rice importer until the early 2000s, had an import ban in place for some years prior to the food price crisis which delinked domestic from international price (Timmer, 2008; Dawe, 2009).[36] By 2006 this policy had led to Indonesian domestic prices being about 37 percent higher than international prices (Fane and Warr, 2008). Figure 9 shows the behaviour of Indonesian rice prices during this period. [37]

[36] Timmer (2008, p. 29) notes that: "Partly because rice prices were already so high in Indonesia, none of the run-up in world prices was passed into domestic prices (indeed, Indonesian rice prices actually fell slightly between early 2007 and early 2008 in the wake of an excellent harvest, stimulated by high producer prices and very good rains from La Niña weather pattern.)"

[37] The FAO price figures are not available for the pre-2008 period and the Warr (2010) series does not extend to 2011. Where they overlap, they differ substantially, so we have used the data from Warr (2010) but did not extend to 2011 with FAO data.

Figure 9: Indonesia - domestic vs. international rice price, rupiah/kg, January 2005 to October 2011



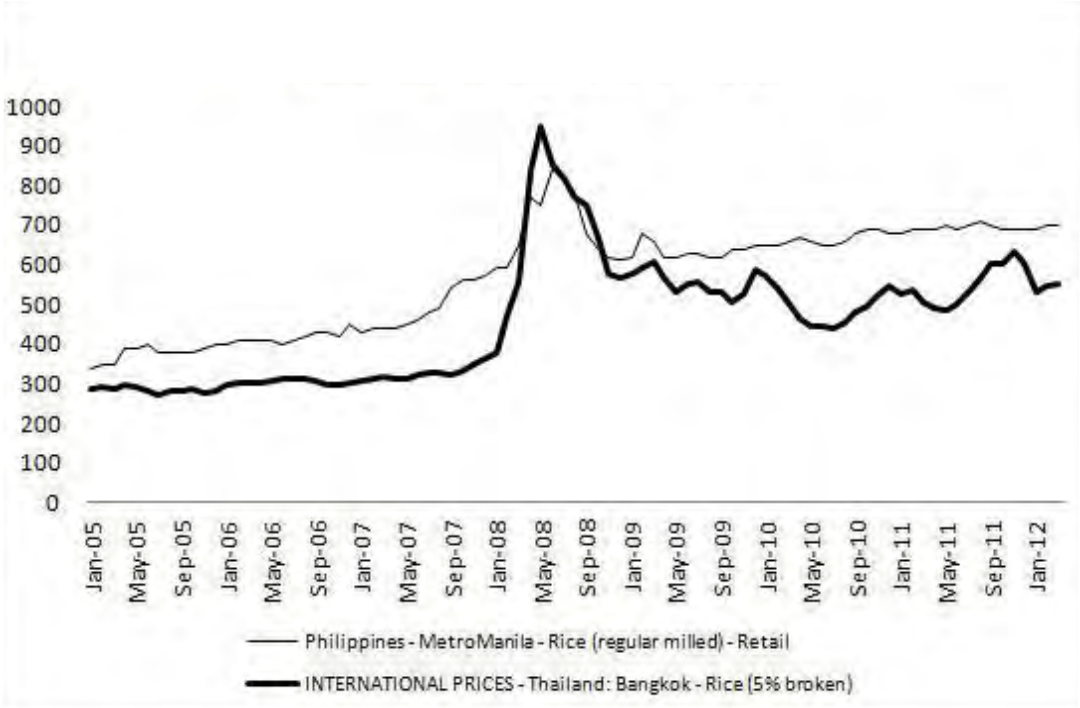
Sources: Warr (2010) based on *Bulog* (rice prices) and Central Bureau of Statistics, Jakarta (exchange rates)

Price insulation was also the policy objective in one of the largest importing country in the region, the Philippines.[38] Before the food price crisis, domestic prices were about 30 percent higher than international prices. Maintaining this "mark-up" over international prices during the food price crisis was politically untenable and a number of measures were implemented to moderate domestic price increases and to increase supply of subsidized food. The government moved to increase rice stocks, mostly through imports, and to improve producer incentives.

By April 2008, import orders for the entire year were completed. Government procurement from domestic producers was also increased, although the share of government procurement in total production remained quite low.

[38] The Philippines, which had emerged as the largest net importer in the region did not succeed in fully stabilizing its domestic price (Timmer, 2008).

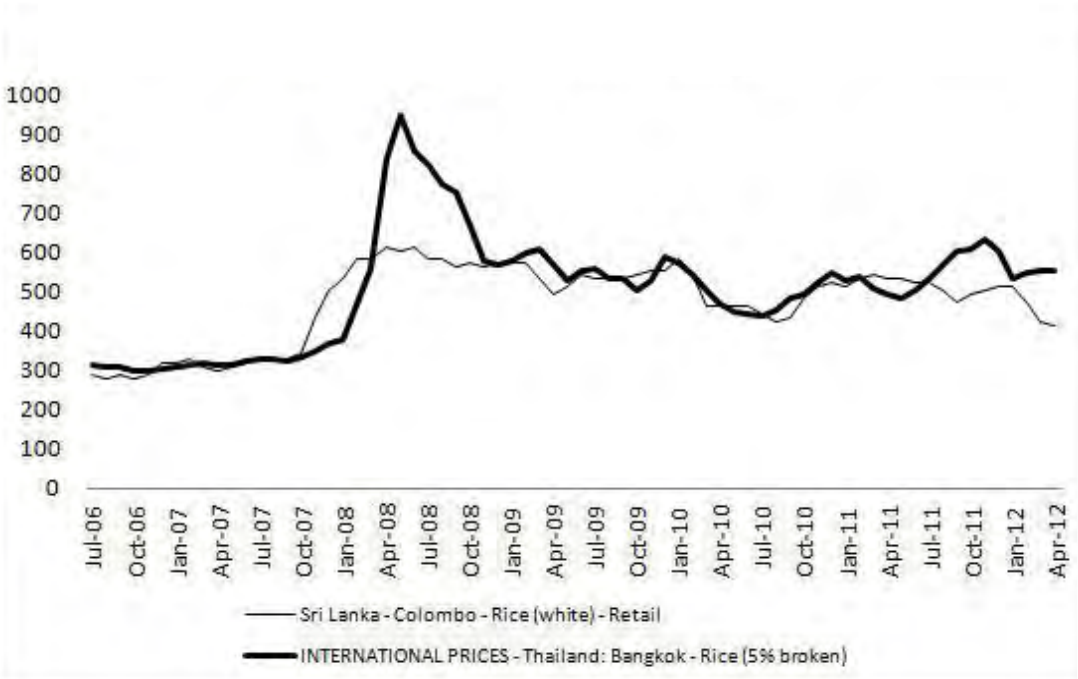
Figure 10: Philippines - domestic vs. international rice price, US$/tonne January 2005 to October 2011



Source: Based on FAO price data: http://www.fao.org/giews/pricetool

In Sri Lanka, a net importer of both rice and wheat, policy responses were rather erratic, with frequent changes in direction. Figure 11 shows how domestic price movements were largely delinked from international prices during the food price crisis period, after having increased substantially at the beginning of the price spike, and they have remained at those levels since. The basic thrust of policy was similar in many ways to that of the Philippines, and proved effective in substantially delinking domestic price increases from the international price surge.

Figure 11: Sri Lanka - domestic vs. international rice price, US$/tonne, July 2006 to March 2012

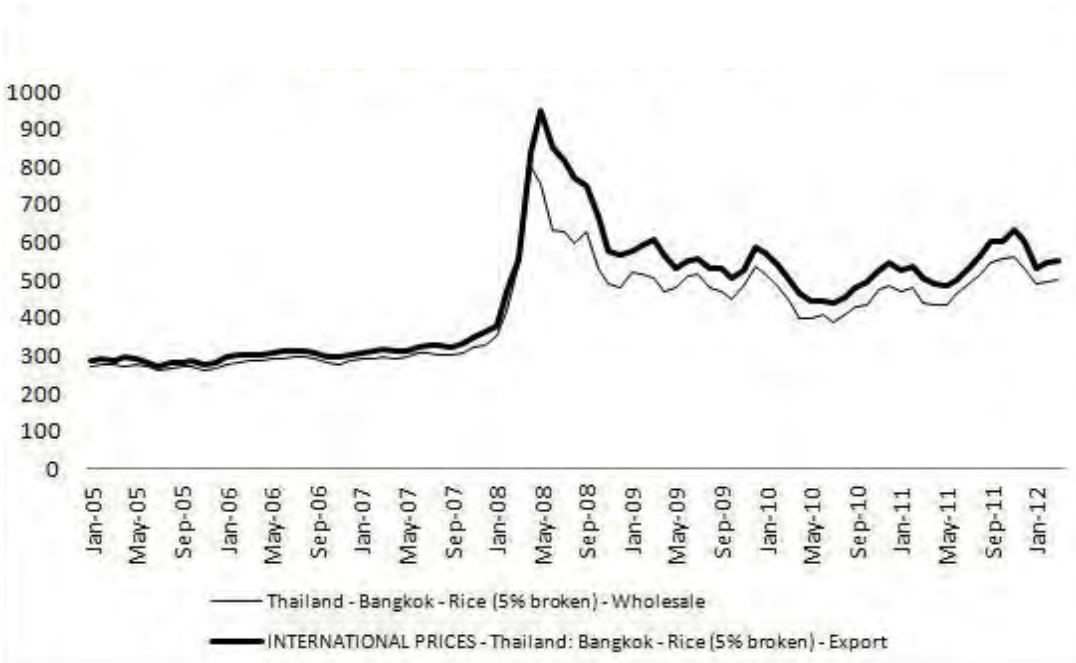


Source: Based on FAO price data: http://www.fao.org/giews/pricetool

Domestic prices in Thailand and Vietnam, the two large Southeast Asian rice exporters, which both gained from high prices, initially tracked international prices quite closely, more than doubling the prices prior to the food price crisis (Figures 12 and 13).[39]

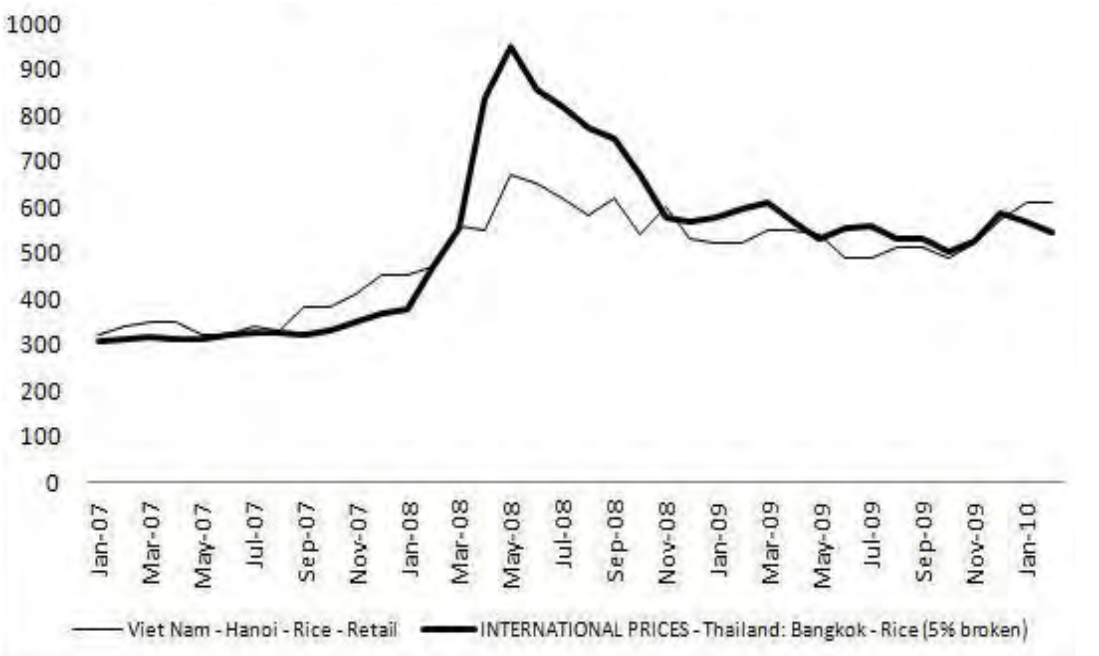
[39] This is confirmed by econometric analysis by Nidhiprabha (2010) for Thailand and Coxhead and Linh (2010) for Vietnam.

Figure 12: Thailand –domestic vs. international rice price, US$/tonne, January 2005 to March 2012



Source: Based on FAO price data: http://www.fao.org/giews/pricetool

Figure 13: Vietnam – domestic vs. international rice price, US$/tonne, January 2007 to February 2010



Source: Based on FAO price data: http://www.fao.org/giews/pricetool

But their patterns of policy responses diverged when international prices surged in 2007/08. Vietnam did not impose a ban on exports and continued to honour existing contracts; however it restricted new export contracts. These restrictions on new export contracts significantly weakened the link between domestic and. international prices although it did not prevent domestic prices from increasing significantly, partly because rice traders apparently continued to purchase stocks in the expectation of higher international prices for future exports (Coxhead and Linh, 2010).

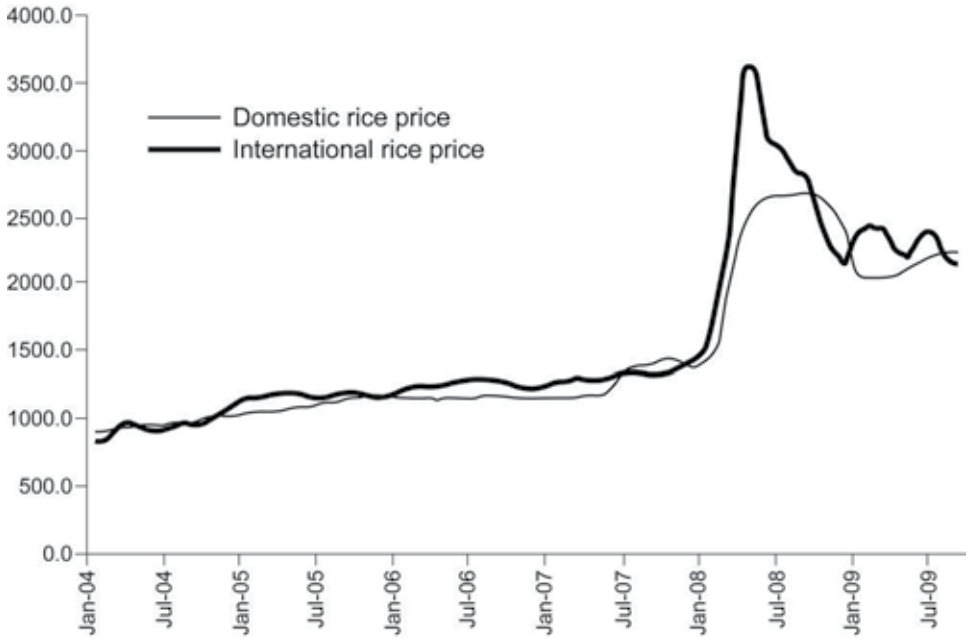
Thailand, on the other hand, did not restrict exports, nor did it implement any other measures that would have dampened internal prices, such as releasing some of the 2.1 million metric tonnes of government-owned rice stocks that had accumulated since a farm-price support programme began in 2005.[40] Again, as in the case of Vietnam, expectations of traders played a major role. Nidhiprabha (2010), in the Thailand country study, describes how domestic prices rose above international prices at one stage as exporters purchased rice and built up stockpiles in anticipation of even steeper international price increases.[41]

Cambodia, which was a rice exporter at the time of the food price crisis, had followed liberal export policies like its neighbour, Vietnam, until the surge in international prices. It also followed Vietnam in imposing export restrictions. But its attempts were not very successful and, according to the Cambodian country study of Jailian, Reyes and Lun (2010), around 70 percent of the international price increase was passed through into domestic price (see Fig.

[40] Timmer (2008).
[41] But as exporters' expectations proved to be false and international rice prices started to ease, the government intervened to shore up the domestic price, a policy that has proved to be very costly for the government.

14). FAO figures indicate a substantial, though lower, increase in domestic prices (Fig 15). This was a result of the limited duration of the export restrictions (two months), exceptions (three provinces along the Vietnam border were exempted from the export bans) and, probably most importantly, the considerable informal trade along its borders.[42] Thus, Cambodia's failure to stabilize domestic prices may be attributed at least in part to the same factors that facilitated price stabilization in Bangladesh and Nepal: small countries that have porous borders with larger neighbours have very limited capacity to set domestic prices.

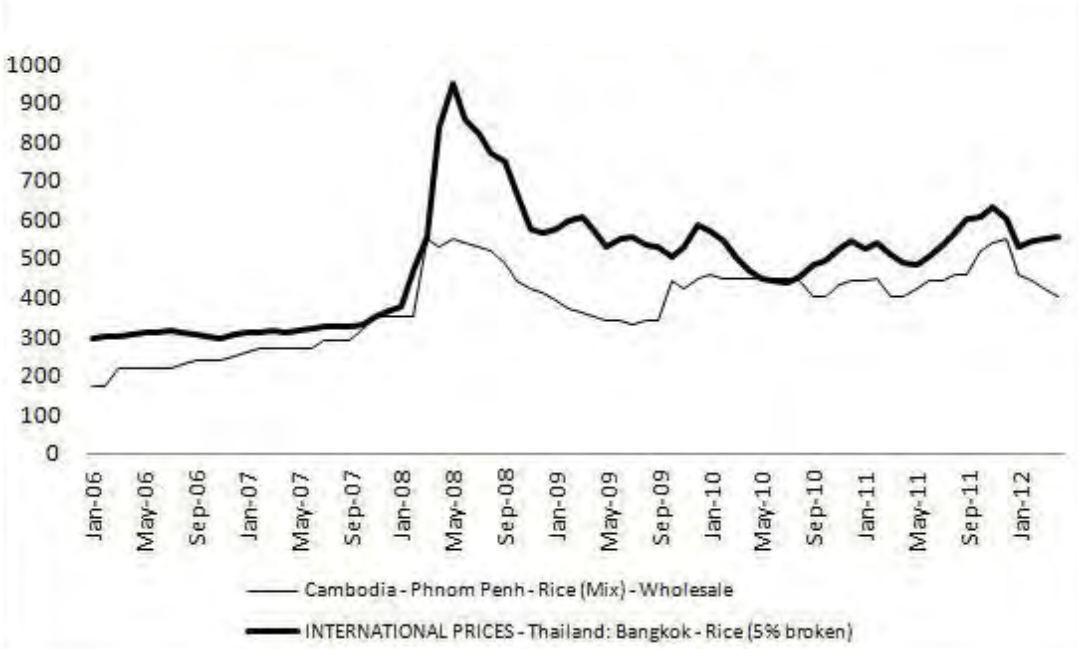
Figure 14: Domestic vs. international price of rice (country study), US$/tonne, January 2005 to October 2011



Notes: Price for Domestic - rice quality 2; International -Thai rice 5% broken
Source: Jalilian, Reyes and Lun (2010), calculations based on data from: NIS (domestic): IRRI (international)

[42] With a highly dollarized economy, Cambodian domestic currency (Riel) moved in tandem with the US dollar, so the 'international' price movements closely followed US dollar-denominated prices.

Figure 15: Cambodia – domestic vs. international rice price, US$/tonne, January 2006 to March 2012



Source: Based on FAO price data: http://www.fao.org/giews/pricetool

Reviewing the various country responses we observe some important differences in how governments attempted to stabilize domestic prices and the degree to which they were successful. Only Thailand made no serious attempt at internal food price stabilization through trade interventions and refrained from imposing trade restrictions. But in the other two Southeast Asian rice exporter countries, Vietnam and Cambodia, domestic prices increased quite substantially.[43] China and India imposed new restrictions to further insulate their internal prices, Indonesia retained a trade regime that provided continuing insulation through this period, the Philippines and Sri Lanka – which are significantly import-dependent – used a combination of trade policies and subsidized imports to prevent sharp price increases . Bangladesh and Nepal, thanks to their long and porous borders with India, benefited from India's price stabilization policies.

Though each country had a package of policy measures which differed from each other, there was one common thread that linked all of them: the abandonment of liberal trade policy.
We can summarize our case study findings on the link between international and domestic rice price as follows: in general, as international prices surged, governments attempted to ensure that the international market volatility was not fully passed on to domestic markets.

This meant that as prices increased the divergence between domestic and international prices increased and market integration weakened. As a result, households in most case study countries, with the notable exception of Thailand, were substantially insulated from the sharpest food price increases recorded in world markets.

The manner in which governments attempted to achieve domestic price stability during a period of high international price instability has received considerable attention and generated a large body of empirical literature. Dawe (2008) highlighted one of the most important

[43] This was also the case in Pakistan.

reasons why international price spikes did not immediately generate major food crises in Asia by drawing attention to the weak co-movements of international and domestic cereal prices in several Asian countries. We explore this in more detail in the next section.

Food price volatility and cross-border transmission of price changes from international to domestic prices[44]

Analyses of price transmission between international and domestic markets typically estimate a 'pass-through coefficient' relating the extent of changes in domestic prices in response to a change in international prices. They are used to analyse actual and projected impacts of international food price changes on food security and levels and changes in food consumption of households. We begin our discussion of this issue by setting out some basic concepts and methodological issues related to the pass-through coefficient and its applications before presenting some of our analysis on the study countries.[45]

Pass-through coefficients

In a world of free (costless) trade (i.e. with no policy-induced barriers to trade or transport, transaction or other trade costs), identical goods have the same price anywhere at a given time ('The Law of One Price').[46] In this case markets are perfectly spatially integrated. By the same token, variations in the prices that prevail across countries for the same good at the same point in time can be attributed to policy-induced trade barriers and other trade costs.

Let P_t^H is the price of a good at time t in the home market and let P_t^f be the price of a good at time t in the international market, where both prices are expressed in terms of a common currency, using the 'nominal' (not the 'real') bilateral exchange rate. When both prices are expressed in the same common currency, any deviations can be attributed to different levels of market integration rather than to currency movements.[47]

In computing the pass-through coefficient in this study, we use the nominal exchange rate for domestic and international price comparisons. This differs from the approach of Dawe (2008) where a measure of the 'real exchange rate' of the country, rather than the nominal or bilateral exchange rate, was used to compare international and domestic price movements. The use of a real exchange rate to determine the extent of pass-through may have been motivated by a desire to capture transmission of 'real' world price changes to 'real' domestic prices. But the use of the real exchange rate change in this context is problematic. First, price comparisons in different markets should be based on a single common yardstick, whether the domestic currency or a particular foreign currency – otherwise any observed differences cannot be attributed to the degree of market integration. Second, though the nominal exchange rate can be assumed not to be significantly influenced by food price changes, this is not true of the real exchange rate. The real exchange rate, which adjusts the nominal exchange rate by the inflation differential of the country and the 'world', is not independent of food prices because food prices have a large impact on consumer price inflation, particularly in developing

[44] This section was co-authored with Rosemarie Edillon

[45] For a discussion of the pass-through issue in relation to recent movements in commodity prices, including food prices, see Chapter 3 in the IMF *World Economic Survey September 2011* (IMF, 2011b); also see Anderson and Martin (2009) for a discussion of the measurement of extent of pass through and role of policy and other market distortions in agriculture.

[46] In practice, even in the absence of any trade barriers and market imperfections, this is expected to hold only approximately for food products, as domestic and international goods are typically imperfect substitutes, trade costs are never zero, and domestic sales require some domestic inputs.

[47] 'Border' prices are usually approximated by CIF prices for imports and FOB prices for exports.

countries.[48] Then, $P_t^H = P_t^f * (1 + B_t)$ where B_t is the equivalent *ad valorem* cost of all trade costs at time *t*. Some of these costs are due to physical factors such as transport costs but some are policy-induced (e.g. a tariff).

Then a pass-through coefficient, s_t, can be expressed as the ratio

(1) $\frac{P_t^H}{P_t^f} = 1 + B_t = s_t$

This has the advantage of parsimony; only the information on P_t^H and P_t^f is required for its measurement. The effect of B_t is manifested in the ratios_t.

A value close to 1 means that the country trades freely in the international market and that market integration is perfect in that prices adjust instantaneously. On the other hand, a very high ratio implies a high level of trade barriers or trade costs. If trade costs are sufficiently high, arbitrage may be completely unprofitable and the good effectively becomes non-tradeable. The extent of the price difference is related to high transport and other physical costs, market structure and the trade regime. For example, a government aiming to protect domestic producers from import competition may impose a high import tariff or a quantitative limit (quota) with the result that domestic prices are kept higher than international prices even when adjusted for other trade costs.

A ratio somewhat different from 1 does not necessarily imply that there are policy- induced barriers to trade – some price differences are almost inevitable as there are unavoidable trade costs (transport, storage etc.) and quality differences, and goods sold in different markets utilize some domestic inputs such as local labour. It should also be noted that this type of pass-through coefficient simply compares levels of domestic and international prices and does not imply anything about the direction of causality; this is particularly important to bear in mind as many discussions of pass through in the context of recent food price spikes appear to assume implicitly that movements in domestic prices are simply a muted reflection of

[48] If a pass-through coefficient is based on international and domestic 'real prices', then it is in effect a ratio that can be expressed as the following:

(1) $$\left(\frac{P_t^H/Q_t^H}{P_0^H/Q_0^H} - 1\right) \div \left(\frac{P_t^f/Q_t^f}{P_0^f/Q_0^f} - 1\right) = d_t$$

Where the quantity P is the price of the good and Q reflecting the nature of the deflators used to compute real prices is the price of a basket of other goods; subscripts 0 and *t* are for two points in time; the superscripts H and f are as defined above. The variable d_t is the ratio of the percentage change in the relative price of the good in the home country and the percentage change in the relative price of the good in the international market. Apart from variables indexed by 0 (where time 0 is also arbitrary), the other variables change at every *t*. Hence changes in d_t can be due to changes in Q^H, Q^f and/or P^f. Converting prices using the real exchange rate, because it incorporates the impact of food prices on domestic inflation – which is not negligible – makes it difficult to interpret the economic meaning of the price comparison. This raises more fundamental issues about the measurement of real prices and the key point to be noted is that a 'real price' is a relative price, typically measuring how the price of a particular commodity has moved relative to a set of relevant other prices, with clear welfare implications. The choice of which set of 'other' prices must be used (and the weights assigned to each) depends on the expenditure patterns of the specific group of consumers (or countries); hence there is no unique, universally valid deflator. It is also reasonable to assume that exchange rate changes are largely independent of movements in international food markets as food trade typically constitutes a small fraction of international trade of a country.

international price movements, with international prices being the driver.[49] Furthermore, price adjustments are not instantaneous and involve time lags, and a pass-through coefficient that incorporates lagged adjustments must be estimated econometrically.

A clearer indication of the existence and nature of policy-induced barriers is provided by the behaviour of the pass-through coefficient over time. If trade costs are more or less unchanged, despite differences in the levels, prices in international and domestic markets move together with similar percentage changes and the pass-through coefficient will be stable. This holds true when trade is subject, for example, to a fixed *ad valorem* tariff, but not necessarily if trade is subject to a quantitative barrier such as a fixed quota, or other types of tariff. Generally, if non-tariff barriers constrain free trade, the pass-through coefficient will change as international prices change. When the pass-through coefficient shows large changes over a short time period, it is usually an indication that the trade regime has changed or that the trade regime is subject to non-tariff barriers.

A government's policy objectives influence how the pass-through coefficient changes. When a government pursues a domestic price target, it can use trade policy instruments to influence levels of imports and exports and thereby affect the pass-through coefficient. In such cases, the pass-through coefficient varies according to P_t^f and the orientation of the policy bias. Consider the case of a government aiming to assist domestic producers by maintaining prices above some lower limit. If international prices move down, the government will want to reduce imports, perhaps by adjusting import tariffs upwards. This translates into a pass-through coefficient which falls with falling international prices. On the other hand, a government aiming to ensure low consumer prices will act in the opposite manner, and the pass-through coefficient will come down as international prices go up. When governments have to balance producer and consumer interests (as is typically the case with rice in Asian developing countries), governments aim to maintain domestic prices within a band, and the link between the pass-through coefficients and P_t^f becomes more complex.

Behaviour of the pass-through coefficient for rice in study countries

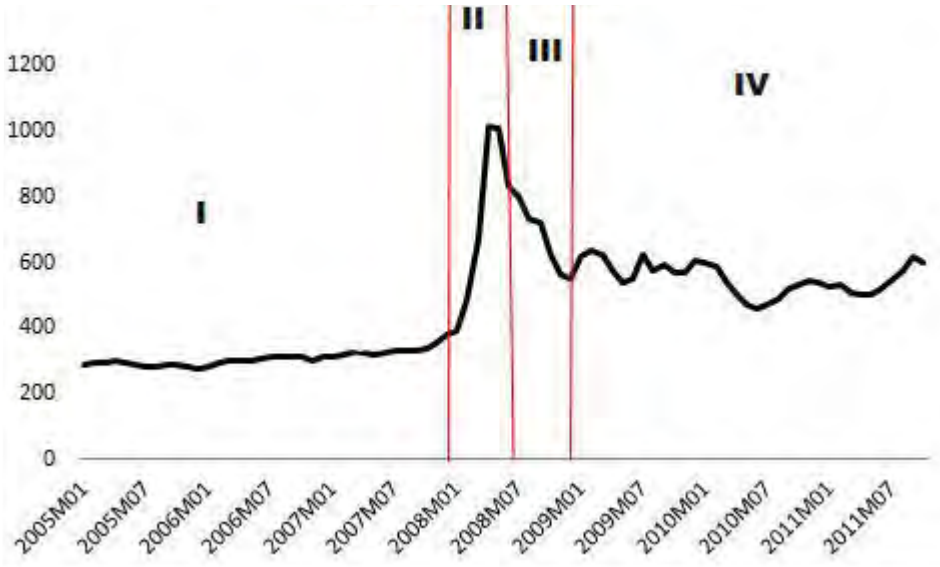
As defined above, our pass-through coefficient is a (static) measure of market integration between domestic and international markets assuming a given price. It can provide useful information on the policy aims driving government responses to international price movements. We now examine how this coefficient has behaved under different international price settings.[50] The trend of the international price of rice, measured by the Bangkok (5% broken) rice price, is shown in Figure 6. We divide the period between January 2005 and October 2011 into four distinct periods: (1) the period until November 2007 when prices were low and stable; (2) from December 2007 to May 2008 when prices rose rapidly; (3) from June to December 2008 when prices fell continuously; (4) from January 2009 onwards when prices were below the April/May peak but remained high and volatile, though with no discernible trend.[51]

[49] This point is particularly important to bear in mind when interpreting the pass-through coefficient for a 'large' country, i.e. a country whose trade levels can influence international market prices. In this case, domestic and international prices interact and there is no simple, passive 'pass through' *from* international *to* domestic prices.

[50] More sophisticated analysis of price transmission utilizes time series econometric tools, and co-integration analysis of the time series is commonly used. Preliminary econometric analysis of price transmission of rice markets in India, Bangladesh and Nepal provides support for the conclusions from the simple analysis reported here.

[51] Unlike wheat and maize prices, international rice prices do not show a second spike in 2010/11.

Figure 16: International price of rice, US$/tonne, 2005-2011



Source: Based on FAO price data: http://www.fao.org/giews/pricetool

The unbiased estimate of average pass-through coefficient over a time period *u* is given by:

(1) $\bar{s}_u = \frac{\bar{P}_u^H}{\bar{P}_u^f}$

Where $\bar{P}_u^H$ and $\bar{P}_u^f$ are the averages of the domestic and international prices over time *u*. The estimates of the average pass-through coefficient are given in Table 4, corresponding to the entire period and to periods I-IV.

Table 4: Estimates of the pass-through coefficients

Country	OVERALL	PERIOD I	PERIOD II	PERIOD III	PERIOD IV
Bangladesh	0.715	0.839	0.643	0.633	0.681
Cambodia	0.796	0.821	0.678	0.695	0.755
China	0.806	0.938	0.554	0.593	0.838
India	0.870	1.042	0.661	0.662	0.869
Indonesia	1.724	.	1.041	0.942	1.541
Philippines	1.206	1.381	0.992	1.033	1.200
Sri Lanka	1.010	1.036	0.861	0.836	0.924
Thailand	0.865	0.933	0.808	0.830	0.851
Vietnam	1.052	1.139	0.808	0.859	0.968

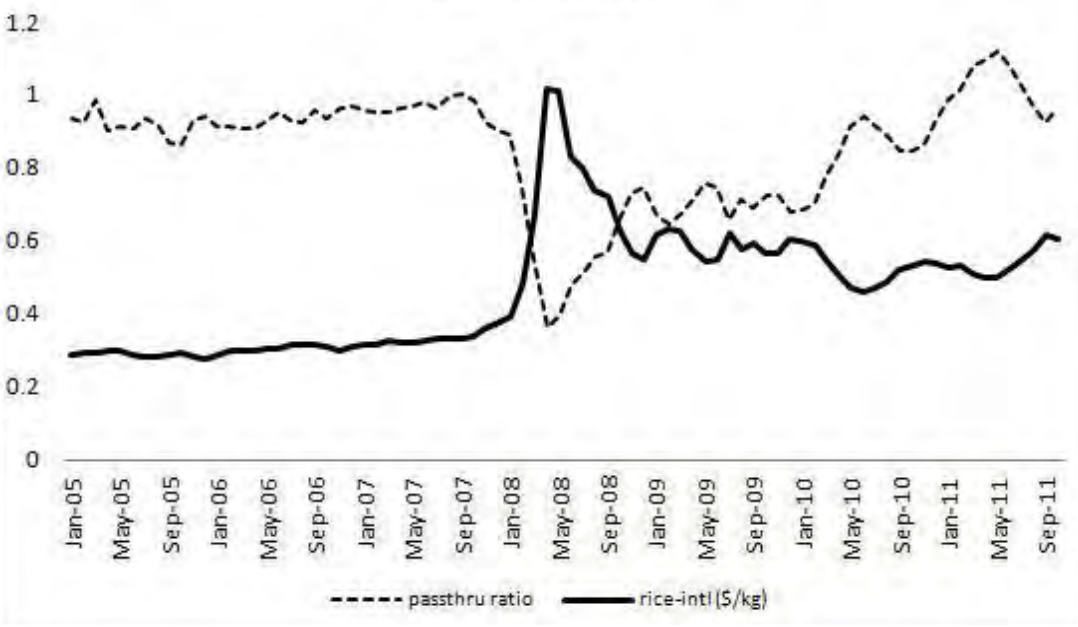
Before the food price crisis, average pass-through coefficients ranged from 0.82 in Cambodia to 1.38 in the Philippines. These figures suggest that Cambodia, a net exporter, had domestic prices which were lower than international prices while the Philippines, a large importer, had

higher domestic prices.[52] The pass-through coefficient was lowest during period II when international prices were continuously increasing, except in the case of Indonesia where the domestic market was almost completely insulated by government policy. The countries where we find the biggest drop are India and China, which moved from being seemingly "free traders" of rice (as evidenced by pass-through coefficients of 1.04 and 0.94, respectively). These countries aggressively protected their consumers in the face of high international prices and reduced the pass-through coefficients to only 0.66 and 0.55, respectively.

Interestingly, the pass-through coefficient ratio from India to Bangladesh prices was higher at 0.97 than the pass-through coefficient ratio from international to Bangladesh prices, indicating greater integration of Bangladesh and the Indian markets with each other compared with their integration with the international market. Overall this is consistent with the picture of most Asian countries stabilizing domestic prices during the 2007/08 price spike. As the price spike subsided, domestic prices and international prices tended to converge and pass-through coefficients rose. However, this should not be interpreted as necessarily signifying that countries were removing trade barriers and adopting free trade policies; in most cases it was simply a result of international prices coming down, thereby moving them closer to domestic prices.

The 'average' pass-through coefficients do not tell the full story as they mask the extent and nature of variability over time. As can be seen in Figures 17 to 26 the pass-through coefficients of the study countries changed with international prices over time. They show clearly that the pass through is not independent of the international price.

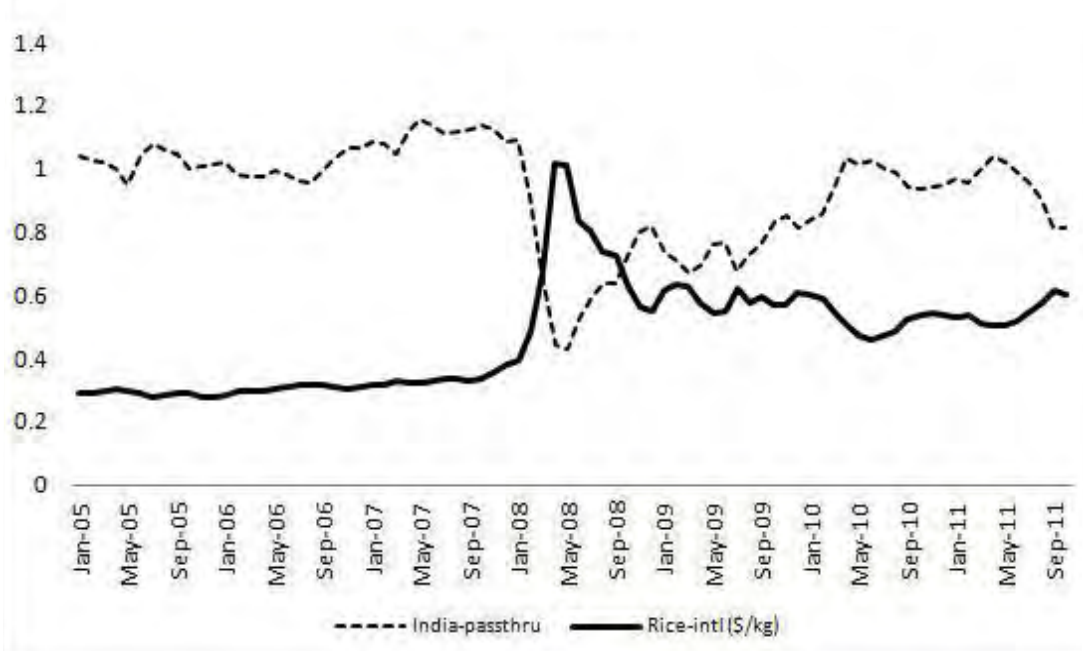
Figure 17: China – pass-through coefficient and international rice price, January 2005 to October 2011



Source: Based on FAO price data: http://www.fao.org/giews/pricetool and author's calculations

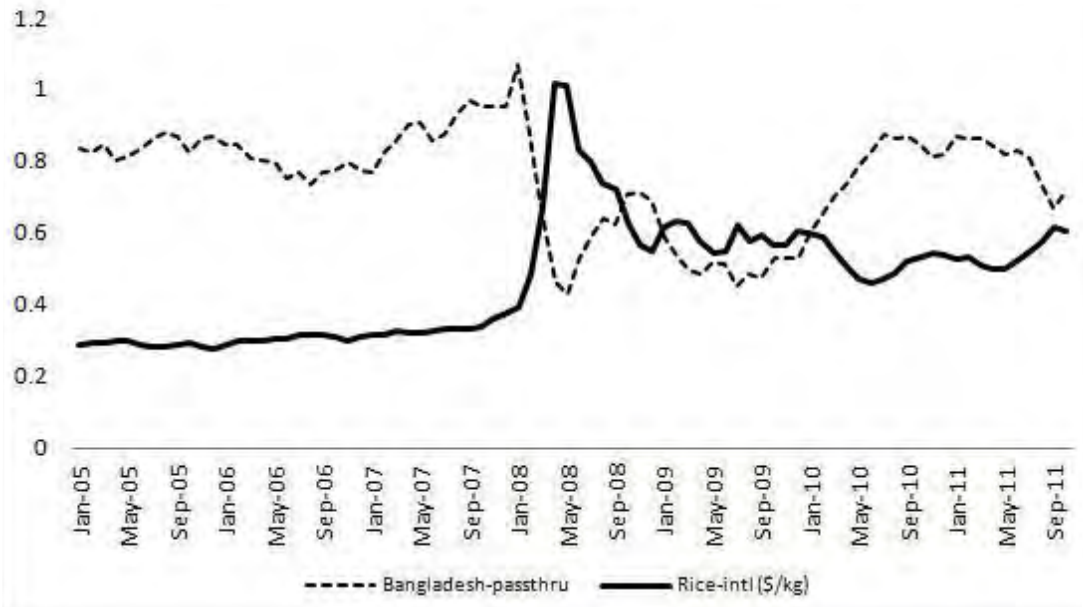
[52] While consistent with the existence of trade policy barriers hindering market integration, such differences in price levels do not necessarily imply policy barriers to trade as they do not adjust for quality differences and trade costs unrelated to policy measures.

Figure 18: India − pass-through coefficient and international rice price, January 2005 to October 2011



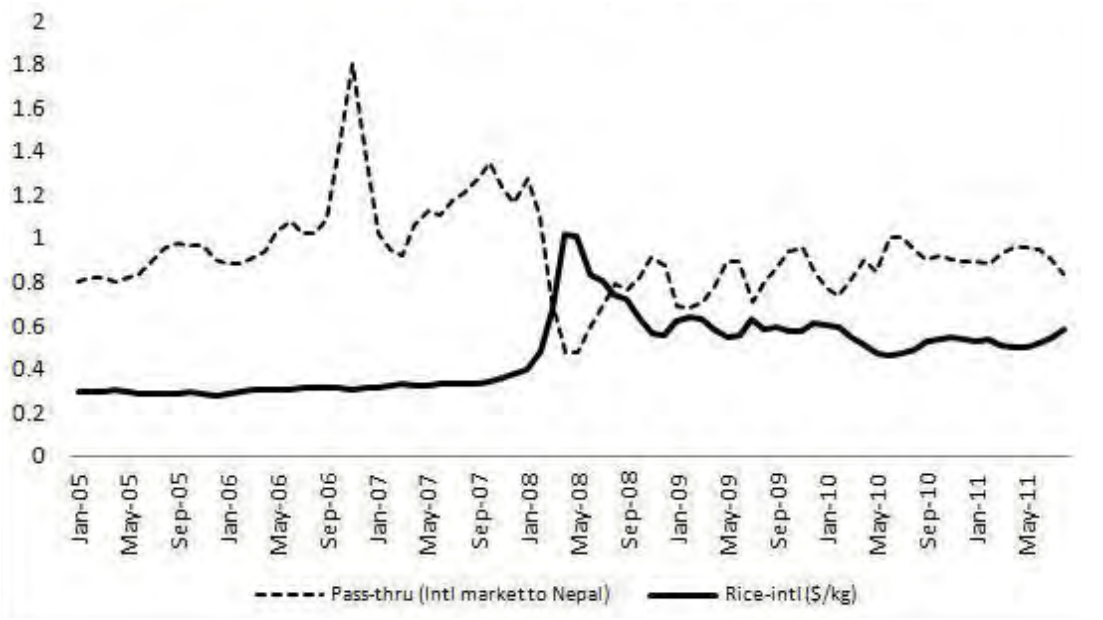
Source: Based on FAO price data: http://www.fao.org/giews/pricetool and author's calculations

Figure 19: Bangladesh − pass-through coefficient and international rice price, January 2005 to October 2011



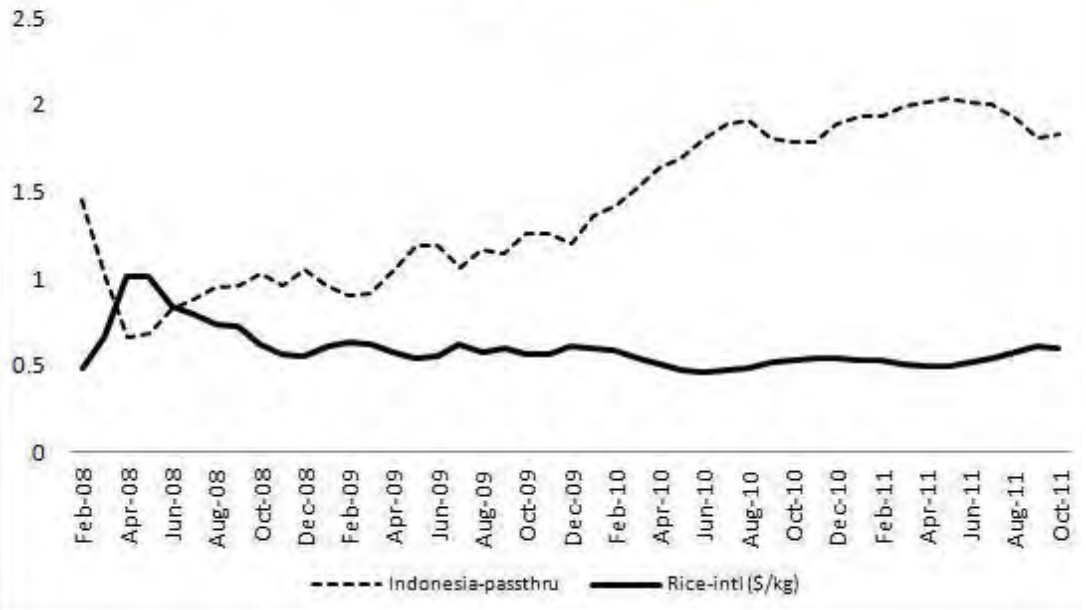
Source: Based on FAO price data: http://www.fao.org/giews/pricetool and author's calculations

Figure 20: Nepal − pass-through coefficient and international rice price, January 2005 to August 2011



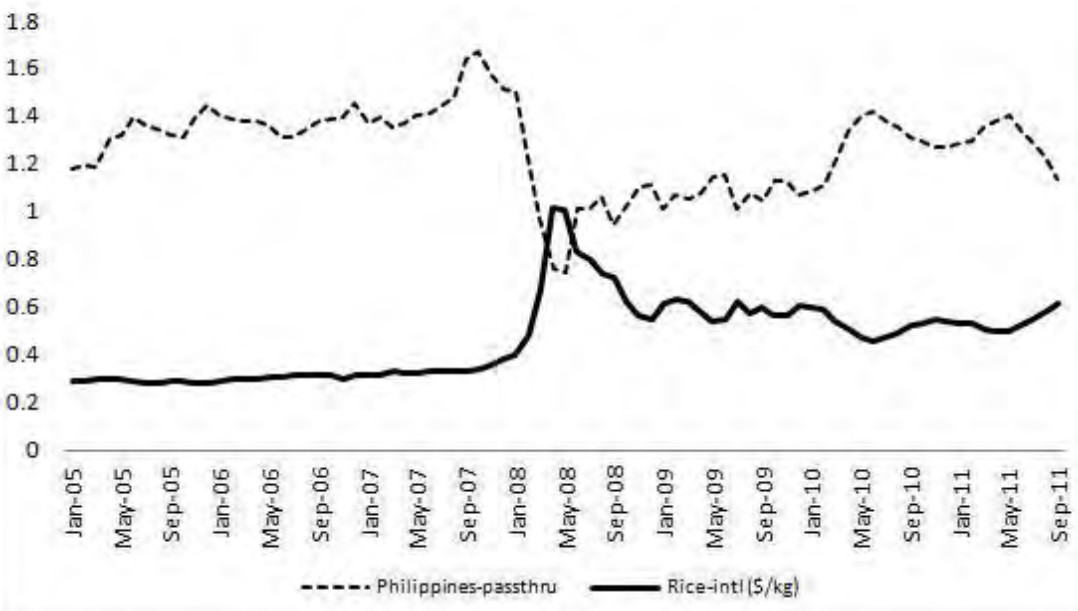
Source: Based on FAO price data: http://www.fao.org/giews/pricetool and author's calculations

Figure 21: Indonesia − pass-through coefficient and international rice price, January 2005 to May 2010



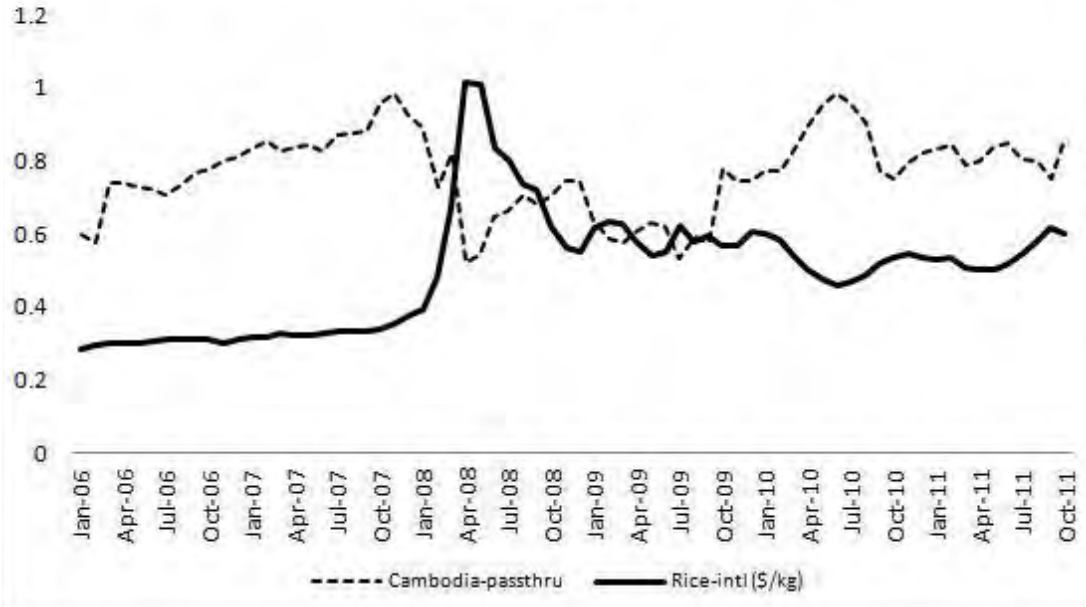
Source: Based on FAO price data: http://www.fao.org/giews/pricetool and author's calculations

Figure 22: Philippines − pass-through coefficient and international rice price, January 2005 to September 2011



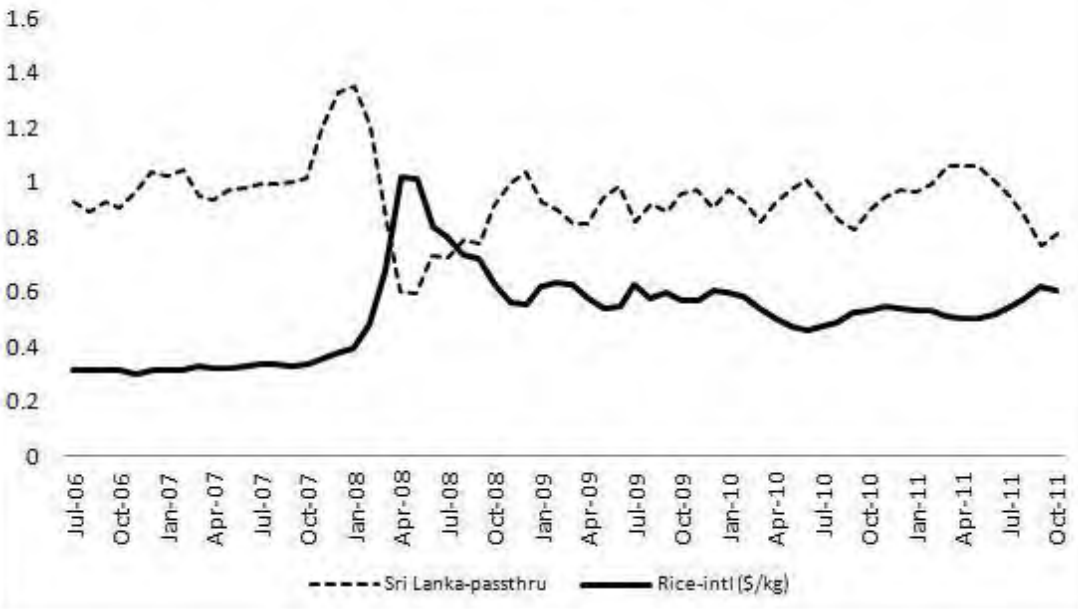
Source: Based on FAO price data: http://www.fao.org/giews/pricetool and author's calculations

Figure 23: Cambodia − pass-through coefficient and international rice price, January 2006 to October 2011



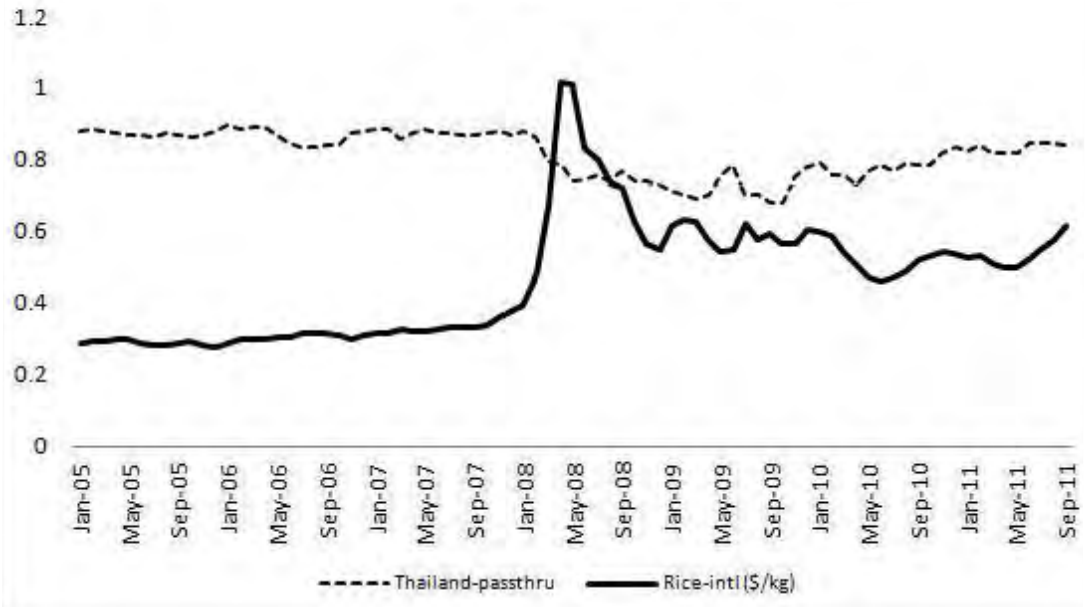
Source: Based on FAO price data: http://www.fao.org/giews/pricetool and author's calculations

Figure 24: Sri Lanka − pass-through coefficient and international rice price, July 2006 to October 2011



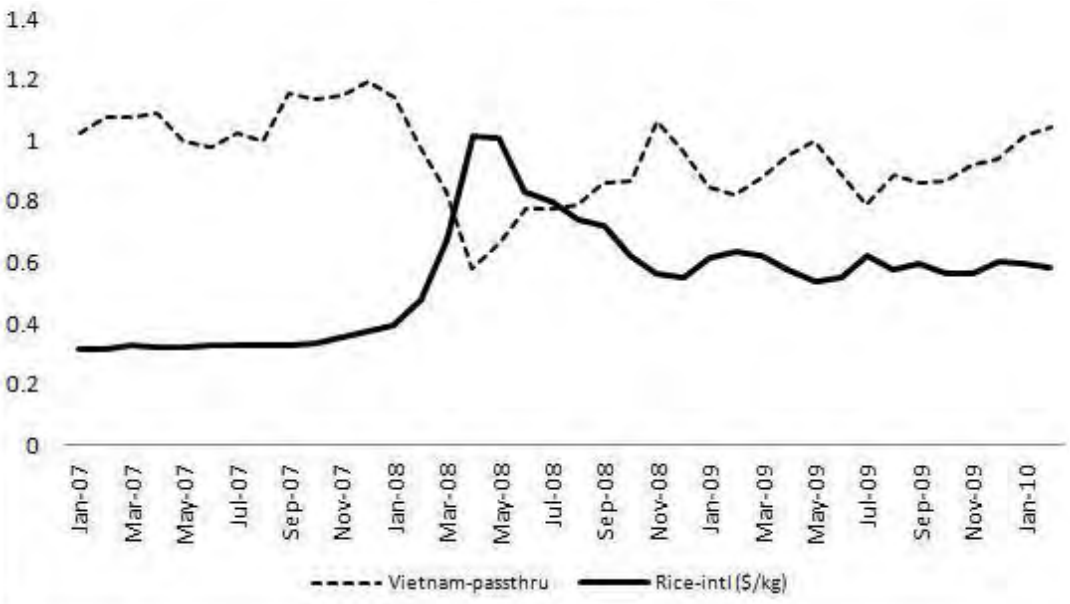
Source: Based on FAO price data: http://www.fao.org/giews/pricetool and author's calculations

Figure 25: Thailand − pass-through coefficient and international rice price, January 2005 to September 2011



Source: Based on FAO price data: http://www.fao.org/giews/pricetool and author's calculations

Figure 26: Vietnam − pass-through coefficient and international rice price, January 2007 to February 2010



Source: Based on FAO price data: http://www.fao.org/giews/pricetool and author's calculations.

An analysis of how pass-through coefficients varied within the sub-periods provides further insights into the dynamics of price transmission and links to policy. High variability in the pass-through coefficient within a short time period can generally be attributed to policy regimes that alter the extent of price transmission.[53] Such variability can be the product of changes in the policy regime itself (for example, changes in *ad valorem* tariffs) or the outcome of a regime that breaks the direct link between prices in the domestic and international markets through non-tariff barriers, such as import or export bans or quantitative restrictions. A measure of these changes in the pass-through coefficients is their coefficient of variation, given in Table 5, broken down by sub-periods, which reveals quite striking differences across countries and, for many countries, high variability within each time period as well.[54]

[53] Some variability can be due to factors such as sluggish domestic price adjustment on the part of firms. Also note that price transmission will not be unidirectional in the case of countries having significant market power.

[54] The unbiased estimate of the coefficient of variation of the pass-through coefficient ratio over a time period *u* is given by:

$$(1)\quad CV_u^s = \sqrt{C_u^{HH} + C_u^{ff} - 2 * C_u^{Hf}}$$

Where C_u^{HH} and C_u^{ff} are the squared coefficients of variations of P^H and P^f, respectively and C_u^{Hf} is the relative covariance between P^H and P^f.

Table 5: Coefficient of Variation of the pass-through coefficients

Country	OVERALL	PERIOD I	PERIOD II	PERIOD III	PERIOD IV
Bangladesh	24.589	7.267	39.132	11.081	22.356
Sri Lanka	23.107	8.260	38.652	14.434	7.726
Nepal	24.915	20.841	49.427	14.834	11.079
India	25.640	5.864	43.203	15.879	13.656
China	27.992	3.604	40.126	16.926	17.710
Thailand	6.732	2.520	7.375	5.634	4.361
Vietnam	15.679	7.277	29.346	11.774	11.215
Cambodia	20.569	12.213	26.498	5.380	15.938
Indonesia	46.949		45.931	8.578	25.568
Philippines	18.735	7.677	31.658	5.247	10.812

The changes in the pass-through coefficients illustrate how the policy regimes in the study countries shaped the nature of price transmission so as to stabilize domestic prices and avoid following international price surges. Pass-through coefficients showed most variability for all countries in period II, reinforcing the message that emerges from the country case studies about government policies during the period of the international price spike: the level of pass through fell to ensure that domestic prices did not follow the international price surge (see Figures 5 to 13 in the previous section). The pass-through coefficient (both overall and within each sub-period) was close to unity and stable throughout this period only in Thailand, the largest exporter of rice, indicating that its trade policies were both open and quite stable throughout this period. Vietnam, the other major rice exporter, had the second most stable pass-through coefficient, but it too exhibited higher volatility after period I, particularly during period II, when international prices surged.

Implications for modelling and forecasting the impact of international price changes

These patterns of pass-through coefficients have important implications for technical modelling and policy analysis as they are essential parameters in models used to estimate the impact of food price increases on poverty and other influences on food insecurity.
Ivanic and Martin (2009, p. 415), for instance, estimated the poverty impact of higher global food prices to be over 100 million people sliding into poverty, wiping out seven years of global poverty alleviation. Critical to these results was the assumption of a 66 percent pass-through parameter of international price increases to domestic prices, based partly on the 51 percent pass through estimated by Dawe (2008) for a sample of Asian countries for the period from 2003 to 2007 (which did not cover the further steep price increase of early 2008).

But, as our analysis has demonstrated, the coefficient of pass through is not independent of the price level: when prices spiked, the degree of pass through fell, as the price stabilization objective became a main driver of government policies and the domestic target price

determined the magnitude of pass through.[55] Using an average pass-through coefficient estimated for a period of relatively low international prices to make projections about what happens to domestic prices when international prices surge upwards leads to gross overestimates of domestic price increases and to misleading forecasts about poverty and food security impacts, because the actual degree of price transmission will be lower. Analysis of the likely domestic impact of international food price movements should use pass-through coefficients which reflect the fact that they are not independent of international prices – that they fall as international prices rise – to avoid overestimating the impact on producers and consumers.

In the extreme case of no market integration, domestic prices would move entirely independently of international prices. But in our study countries this was never the case for the main cereals, rice and wheat: the degree of market integration, and therefore the extent of price transmission, between domestic and international food markets is a policy-influenced function of the level of international prices. This explains why, in the absence of major domestic supply shocks during this period, the level of domestic price volatility of major cereal grains in our study countries was generally lower than in international markets. But purely domestic developments also had an impact on internal food prices, as discussed in the next section.

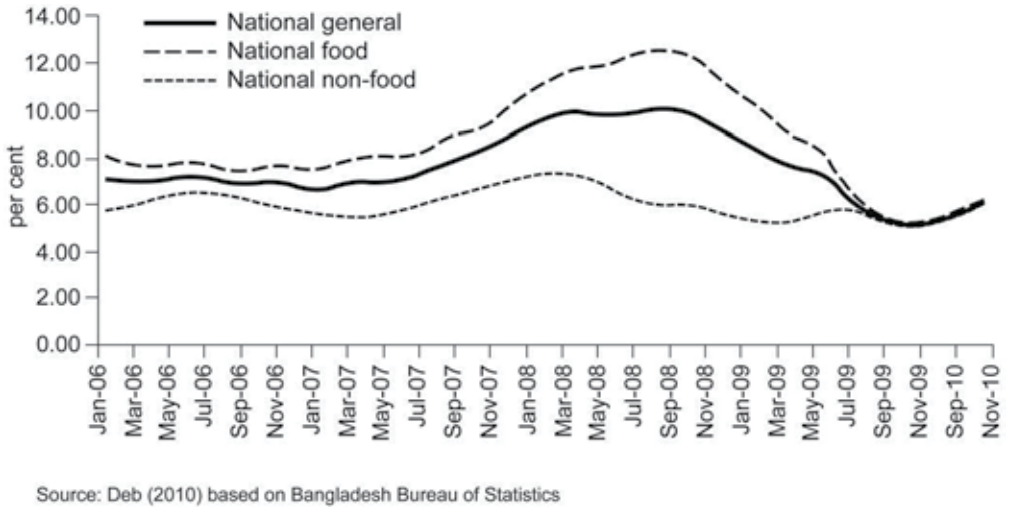
Domestic inflation and relative prices

Although the focus in the previous section was on international price transmission to domestic markets, because the three main shocks common to these countries were of international origin, in principle, domestic real prices can change even when they are unchanged in international currency terms. This is the case if the internal relative price of food changes because of differential inflation rates between food and non-food categories. It is possible that some of the observed changes in domestic food prices may be driven primarily by internal macroeconomic factors or supply shocks rather than by international price movements. In other words, even when a co-movement in domestic and international price is observed, it should not be automatically attributed to price transmission from international markets to domestic markets.

To illustrate this, in Figures 27, 28 and 29 we show how the internal relative price of rice has behaved in Bangladesh, the Philippines and Sri Lanka.

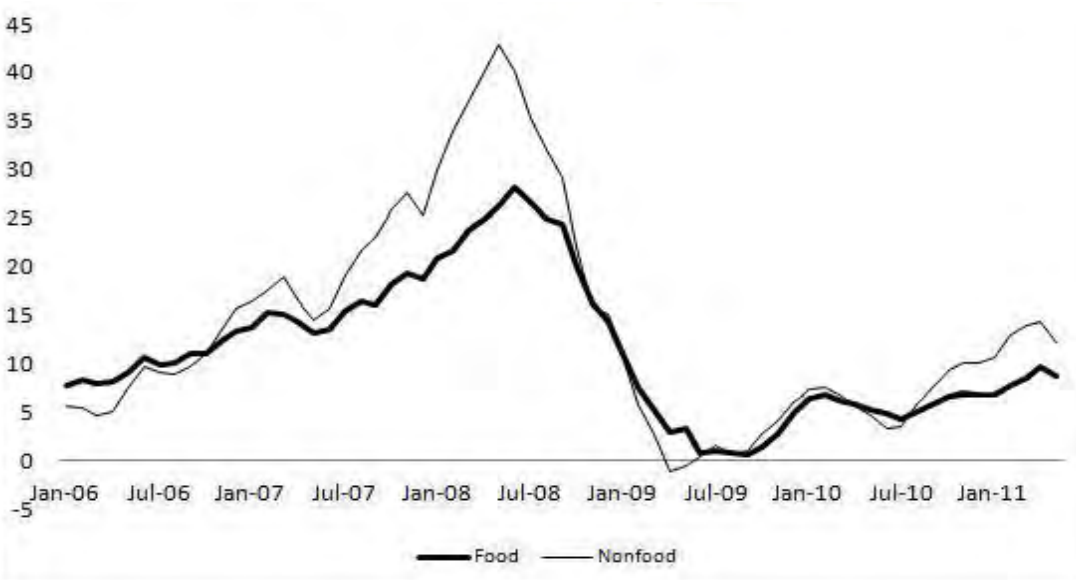
[55] Anderson and Nelgen (2010) have noted that this can happen also when there are big falls in international prices, as during the period 1984 to 1988.

Figure 27: Bangladesh – inflation (moving average), January 2006 to March 2010



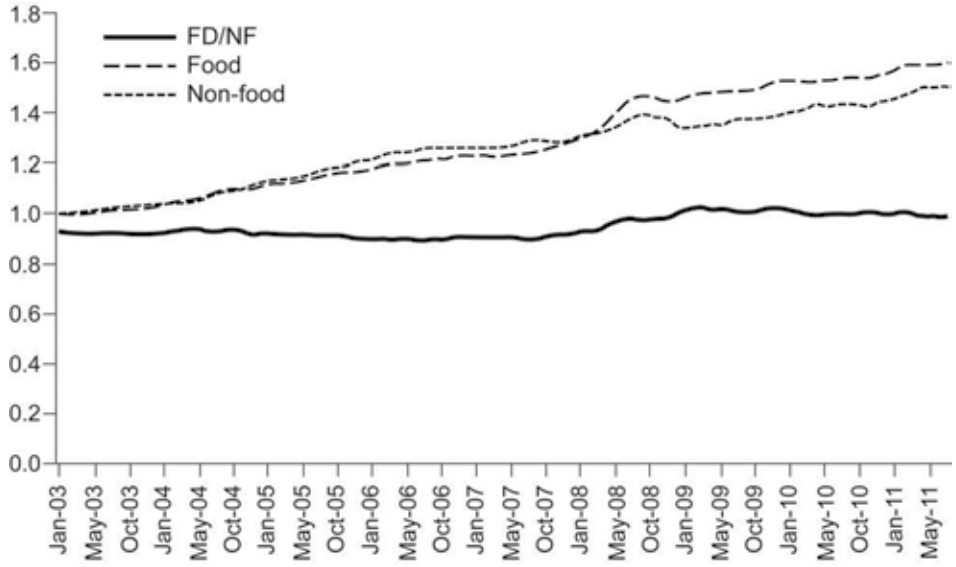
Source: Deb (2010) based on Bangladesh Bureau of Statistics

Figure 28: Sri Lanka – food vs. nonfood price inflation, January 2006 to May 2011



Source: Sri Lanka Department of Census and Statistics, Prices and Wages Division

Figure 29: Philippines – food vs. nonfood price inflation, January 2004 to July 2011



Source: Edillon (2011)

In Bangladesh, internally-generated inflation had an arguably larger impact than high international prices on domestic food prices and household food security during this period. Though international price transmission was low, food price inflation was both substantial and consistently higher than non-food price inflation. In Sri Lanka, both food and non-food price inflation were in double digits as early as mid-2006, before the food price crisis, and this situation persisted until the beginning of 2009. In the Philippines, food price inflation was observed to be higher than non-food price inflation during the lead-up to 2007 and all through 2009. We now look at the evidence on the impact of the food price crisis on poverty and food security in the study countries.

Impact of the food price crisis on poverty and food security

As we have seen, most countries insulated their internal food prices fairly successfully, so that the impact of the international food price surge was not fully passed on. In addition, the duration of high prices is also obviously an important factor. Fortunately, the sharp spike in international prices lasted only for a few months and its impact on domestic prices was not only muted but also short-lived. But many poorer households did face food insecurity pressure during this period because, despite limited pass through, domestic food price inflation hit double digit levels in almost all Asian developing economies in early 2008.[56]
Even a short period of high food prices can impose considerable distress on vulnerable households, particularly at a time of increasing general inflation when adjustments to nominal incomes, including wage adjustments, are sluggish. Household food security depends on the capacity to access food, which depends on the extent to which food prices change relative to incomes.

In both China and India, the success with delinking domestic cereal prices from international prices meant that the international food price hike had relatively minor effects on overall household food security. In addition, this occurred during a period of rapid economic growth when income growth was quite rapid. In the case of China, some food prices did increase, as international price increases in soybean were passed on and domestic pork prices increased

[56] ADB (2008).

due to (unrelated) internal supply shocks. India also experienced some food price inflation but there was no sense in which the situation developed into a crisis.

In Indonesia, domestic rice prices were delinked from international markets by a pre-existing import restriction policy, a partial ban, which had imposed what was in effect a 'quota' on rice imports. But as Warr and Yusuf (2010) point out in their country study of Indonesia, this did not necessarily mean that food security in Indonesia had been enhanced by this particular policy. They asked the question: what would have been the impact of a different policy, an 'equivalent tariff', which provided the same level of protection to domestic rice producers?[57]

According to their analysis, during the temporary price spike the quota regime prevented the international price increase from being transmitted to domestic consumers, whereas under a tariff, domestic prices would have moved up with world prices, increasing poverty and food insecurity during the period of high international prices.[58] Hence the quota policy maintained the food security of poorer households during the period of the temporary international price hike.

But having this import quota in place meant that domestic prices were normally ('permanently') kept higher than they would have been, compared with a situation where there was a tariff. This policy therefore imposed a higher food price 'permanently' on all Indonesian households, though they were insulated from the sudden and sharp price increase when international prices shot up. Warr and Yusuf estimated that, although the quota helped to avoid an increase of food insecurity for roughly 115 000 households (0.05 percent of total households) during the price spike, if there were no import quota, some 450 000 households (0.19 percent of total households) would have had better food security during 'normal' times. Hence the quota policy prevented the temporary increase in food insecurity of some 115 000 households during the price spike, but this came at the cost of imposing a permanent increase in food insecurity on a population four times larger than that.

This has important implications for policy and highlights the significant trade-offs that should be considered in framing policies to protect food security: some measures that protect households during short periods of very high prices can impose substantial long-term reductions in food security for large groups of people.

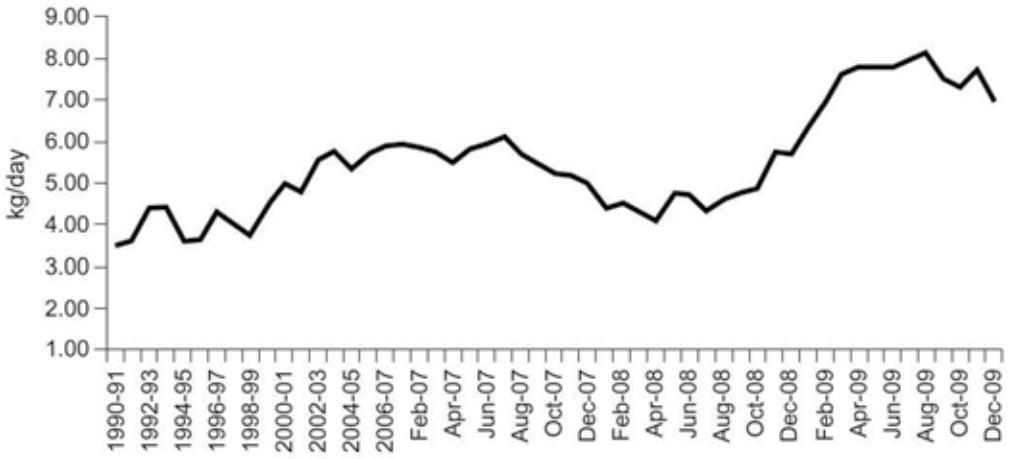
The Philippines managed to partially insulate the domestic price from following the international spike, though at one point the domestic price was 65 percent higher than the corresponding monthly price in the previous year. Moreover, domestic prices, which had been higher than international prices before the food price crisis, were held below international prices, imposing a huge fiscal cost. Not only did the government purchase rice when international prices were at its highest, this imported rice was subsequently sold at heavily subsidized prices. Once the food price crisis was over, domestic prices moved above international prices again.

In the absence of direct survey evidence on the impact of high food prices on food consumption in Bangladesh, in the Bangladesh country study Deb (2010) looked at two indicators of real incomes of low-income households to assess the likely impact on food security. One measure of real wages, the 'rice equivalent wage' – computed using changes in nominal wages and rice prices – indicated that real agricultural wages did not fall sharply during the period of rapid rice price increase (Figure 9). However, when the real agricultural

[57] Note that the comparison is not with a free trade regime but with a different form of trade restriction which, in contrast to a quota, would have allowed import levels to vary with international and domestic price differences, with some pass through of international price movements to domestic markets.
[58] The impact of high international prices was to reduce the profits made by importers who had access to the import quota.

wage rate is computed using the basket of all consumption goods, real wages appear to have been maintained as nominal wages kept pace with the general cost of living over time (Figure 10). It is likely that poorer net food buyer households who spend a large proportion of their expenditure on food were in fact worse off.[59]

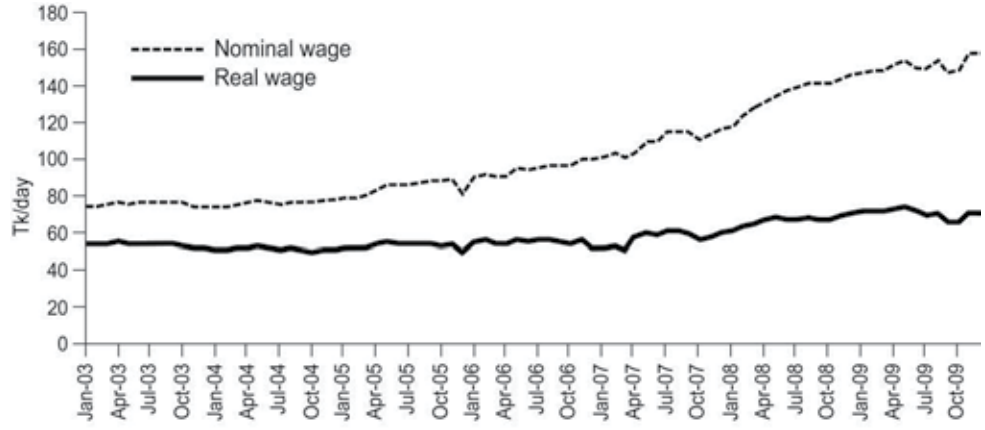
Figure 30: Bangladesh − average daily 'rice equivalent' wage



Source: Deb (2010) based on Bangladesh Bureau of Statistics

Source: Deb (2010) based on Bangladesh Bureau of Statistics

Figure 31: Bangladesh − average daily nominal and real agricultural wages



Source: Deb (2010) based on data from Bangladesh Bureau of Statistics (BBS), Monthly Statistical Bulletin

Nepal had serious food security problems throughout this period, unrelated to the international food price crisis. Though the Indian food export restrictions may also have had some impact, Nepal was also affected by a winter drought which reduced crop production and by political instability which affected supply and increased transportation costs. In the hilly regions with poorly integrated, isolated markets due to high transport costs, traders reportedly aggravated supply problems and exploited their local monopoly powers.

[59] When a general cost of living index based on a particular 'basket of goods' is used as a deflator to assess movements in real wages, it is possible that the resulting picture may not fully capture how price movements affect the food security of all households. This is because many households will have very different consumption patterns from the 'average'. This is likely to be the case when we consider the situation of the poorer households who spend a larger proportion of their income on food compared to the 'average' household. The sharp increase in food prices would have had a more serious negative impact on such households.

Domestic inflation caused by internal macroeconomic policies was also the main driver of food price increases in Sri Lanka and significantly affected both urban and low-income rural households. Though direct survey evidence of reduced food consumption is lacking, a simulation analysis based on household consumption data by Weerahewa and Kodithuwakku (2010), in their Sri Lanka country study, indicated that food price increases may have reduced calorie (8.5 percent) and protein (6 percent) intake of poorer households. Korale-Gedera, Ratnasiri and Bandara (2012) highlight the impact of income increases on food security, and conclude that between 2007 and 2009 higher incomes largely offset the effects of food price increases, and that by the end of the period the percentage of undernourished population had increased by only 1.7 percent.

Thailand, where the vast majority of the poor live in rural areas and rural wages are a major source of their income, was probably the one country where the food price crisis, despite adversely affecting some poorer households, may have had a positive impact on overall poverty levels. Warr (2008), discussing the impact of the 2007/08 price spike, had suggested that despite the benefits of high prices to large numbers of farmers, sustained high food prices, especially prices of staple grains, will worsen overall poverty incidence. But Nidhiprabha (2010), in the Thailand country study, points to the historical high correlation of high rice prices with low poverty rates in Thailand and trends in employment and income growth and concludes that poverty rates fell significantly during the period of high rice prices. This conclusion is lent support by data on farm incomes (which grew by 33 percent in 2008) and the strong growth in real agricultural wages during 2007/08.

The picture was more mixed in Vietnam. Rice dominates Vietnamese agriculture, accounting for nearly 60 percent of cropland and the vast majority of farm employment. But there is much diversity among households which makes broad generalizations difficult and potentially misleading. Four-fifths of poor households are rice-growers. Nearly 60 percent of all farmers are net sellers but 33 percent of all rice comes from just 5 percent of farmers in the Mekong Delta region. Unfortunately, there are no survey data available on the impact of high rice prices on household consumption and living standards. Coxhead and Linh (2010), in the Vietnam country study, modelled the impact of the food price increase and quantified the income effects of high prices on poorer households through rice farming, agricultural wages, and rural farm and nonfarm employment. Their analysis points to the need to make a distinction between the long-term and short-term impacts of high rice prices. A long- term increase in rice prices can be poverty-reducing (hence enhancing food security overall) in the long run because of the positive impact on incomes of the poor.[60] But a temporary, short-lived increase in prices is unlikely to induce higher employment and agricultural wage increases so, on balance, many poor households will be worse off. This latter outcome was likely to have been the case in the early months of 2008. The effects of high rice prices on poor households, moreover, were exacerbated by rapidly rising fuel prices and sharply higher inflation, the latter driven by a foreign investment boom in 2007.[61]

The case of Cambodia, a very low-income net food exporter with the bulk of its population living in rural areas and involved in agriculture, is particularly interesting and also highly instructive. In the Cambodian country study, Jalilian, Reyes and Pide (2010) provide survey

[60] It is noted, however, that the distribution of gains from higher rice prices can be affected by the fact that Vietnamese rice export trade is dominated by two parastatal trading agencies with close ties to the Vietnam Food Association, the agency with strong influence on export policies and export targets.

[61] Moreover, as the authors acknowledge, their use of an average consumer price index adjustment to calculate poverty changes for all households understates the extent to which higher food prices erode the real incomes of the poorest households. Correcting for this is likely to reveal larger increases in poverty, especially at the lowest range of the household income distribution, and especially in the short run.

evidence that sheds light on one of the most debated issues at present: what is the poverty impact of a food price increase in an agriculture-dominated, low- income, developing economy?

In Cambodia's case, despite being a rice exporter, some 20 percent of the population is food-insecure in the lean season when food stocks run low. The vast majority (more than 90 percent) of these food insecure people live in rural areas. Around 60 percent of households of rural households are net sellers of rice, but many are small, marginal sellers, while many net buyers are also small, marginal buyers.

Jalilian, Reyes and Lun (2010) drew on Cambodia Development Research Institute's (CDRI) Vulnerable Workers Surveys,[62] conducted during the food price crisis period, along with other household surveys and previous data from the Cambodia Socio-Economic Surveys to assess the actual impact of the food price increase on a range of poverty and food consumption indicators. When food prices were increasing relatively slowly during the 2004-2007 period (37 percent for Phnom Penh, 45 percent for other urban areas, and 41 percent for rural areas), Cambodia Socio-Economic Surveys showed that per capita consumption and poverty indicators saw improvement across all groups. Per capita daily consumption in constant terms increased by 13 percent in rural areas, 36 percent in Phnom Penh, and 27 percent in other urban areas between 2004 and 2007, while the proportion of the population falling below the food poverty line decreased by about 1.3 percent, 2.4 percent and 2.0 percent, respectively.[63]

The food price crisis brought an end to this improvement for large numbers of poor households. Surveys conducted in 2008 during the food price crisis (but before the impact of the global financial and economic crises was felt) showed that net rice sellers benefitted, as expected, but the food security of more than half of households, particularly in rural areas, went down. Between March 2008 and September 2008 in particular, household food consumption on the whole declined by about 8.4 percent. Such households had cut back on quantity and quality of food and spent less on health care, education and agricultural inputs during the period of high rice prices. More than half of the surveyed households reported decreases in the quantity and quality of food consumed and many households were forced to resort to asset sales. The decrease in the quantity and quality of food consumed was greater in rural areas – where poverty is higher but where theoretical reasoning suggests gains may also be higher – relative to Phnom Penh and other urban areas. Data from the Cambodia Demographic and Health Survey (2005) and the Cambodia Anthropometrics Study (2008) indicate that the wasting prevalence among children below 5 years of age increased from 8.4 to 8.9 percent while underweight prevalence among the same group of children increased from 28.2 to 28.8 percent. The prevalence of diarrhoea among children below 5 years of age also increased from 22 to 30 percent between 2005 and 2008.

In summary, while the region as a whole did not experience a major deterioration in overall food security, not all households were immune from the impact of high food prices. The evidence on actual food consumption (Cambodia), agricultural wages (Bangladesh) and analytical results from other countries that experienced significant food price inflation suggests that higher food prices did have a negative effect on the food security of some of the poorer households.

[62] Since 2003, CDRI has been conducting four rounds of survey in a year (February. May, August and November, except in 2008 when the survey was conducted only in November) of daily earnings of workers from 10 'vulnerable' occupations. For the May 2009 survey, two occupations were added, i.e. tourist sector workers and migrant workers. See Tong et al (2009) for more details.

[63] Due to lower non-food inflation, poverty improvements against the overall poverty line were even higher.

In Cambodia, a very low-income economy dominated by rural households, the food price hike increased poverty and food insecurity in both urban and rural areas. Some groups of farmers and rural workers benefitted from higher food prices but the sharp food price spike tended to increase poverty and food insecurity of the poor, who are overwhelmingly net food buyers, though generally rapid economic growth during the food price crisis period helped to offset the impact on real incomes. On balance, policies which insulated households from high international food prices helped maintain household food security and were therefore pro-poor.

But as shown in the case of Thailand, high food prices did not always increase overall poverty, though some groups such as the urban poor were negatively affected. This (admittedly rather limited) evidence provides some support for the theoretically plausible outcome of higher food prices conferring a net benefit on the poor. It can be argued that, in the case of Thailand, if the period of high prices had been sustained for a longer time, the higher agricultural labour demand would have led eventually to wider increases in labour wages, thereby raising real incomes of the urban poor. In fact, rural poor in both Cambodia and Thailand seem to have benefitted in the period prior to the 2007/08 price spike. when food prices were rising slowly but steadily.

This highlights the fact that a price spike of short duration has a different impact from that of a steady long-term upward trend which leads to resource re-allocation and labour market adjustments. Poorer households, with very limited access to savings or credit markets, are particularly vulnerable to sudden swings in prices, particularly food price increases. But the analysis of the Indonesian policy regime has suggested that long-term import restrictions which raise the domestic food price may insulate domestic prices and safeguard households from temporary price spikes but at the cost of a higher level of food insecurity and poverty in 'normal' times. Hence it is important to choose policy instruments that can help poor households to cope with sharp but temporary food price hikes without undermining the food security of large numbers of poor households during 'normal' times and also maintaining incentives for farmers to produce more in response to longer-term trends.

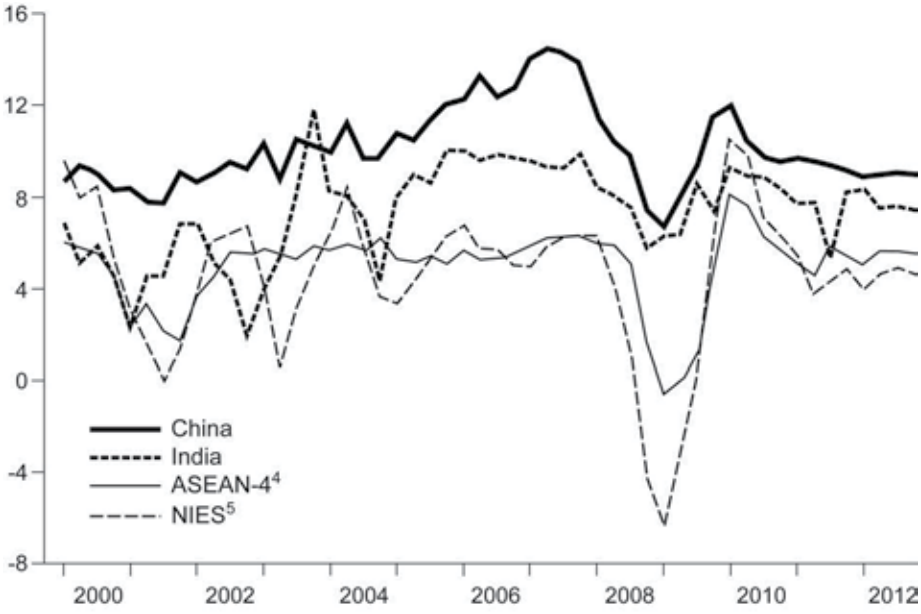
From an international perspective, imposition of trade restrictive policies by exporters (aimed at stabilizing domestic prices) led to sharply higher international prices, thereby definitely increasing food insecurity in net importer countries (at least in the short term) and did long term damage to the international food trading system.

6. Impact of the global financial crisis and the global economic recession of 2008/09

When the global financial crisis erupted in the second half of 2008, there were widespread fears that the financial crisis might be the trigger for a deep and protracted global economic recession, or even a depression. At the beginning of 2009 the global economy appeared to be moving rapidly towards a worst case scenario, with the developed economies of the West sliding into recession and growth slumping across the Asian region. Most economies started to slow down in late 2008 and continued their deceleration into 2009. But by the second quarter of 2009 most Asian economies had started to recover; a year later they were back to (or close to) the pre-shock growth path (Figure 32).[64]

[64] For reviews of the impact of the global financial and economic crises, policy responses and subsequent developments, see ADB (2009, 2010a) and various issues of the IMF publications, *World Economic Outlook, WEO updates, Regional Economic Outlook, Asia and Pacific* and World Bank (2010b).

Figure 32: Real GDP growth in major Asian economies (excluding Japan)



Notes: 4: Indonesia, Malaysia, Philippines and Thailand
Notes: 5: Hong Kong, Korea, Singapore and Taiwan (?) Province of China
Source: Based on IMF (2011a)

However, there was considerable diversity in their 2009 performance among the Asian developing countries. India's growth rate improved slightly, from 6.2 percent in 2008 to 6.8 percent, and China registered impressive growth despite a mild slowdown from 9.6 percent to 9.2 percent. Most of the other economies grew, although more slowly, but Cambodia and Thailand recorded negative growth in 2009.

A simple comparison of annual average growth rates between 2008 and 2009 can be misleading in terms of understanding how countries were affected by and coped with the crisis. The annual averages mask the severe impact that many countries, including China, experienced in the immediate aftermath of the crisis. Many countries had sharp and painful shocks to incomes and employment from late 2008 to mid-2009. The impact from global financial and economic crises came through several channels, and the more trade-dependent economies were strongly affected, through both price and trade volume changes. Global demand for Asian manufactures fell, as did tourism and other service exports, capital inflows slowed down or reversed, and investor sentiments turned almost uniformly negative.

In the late 2008 to early 2009 period, when most signals from the global economy were negative, fears of a deep and prolonged global economic recession heightened concerns about food security in developing countries. The possibility of large job losses, sharply lower growth and increases in poverty loomed large: "The global economy is undergoing its most severe recession of the post-war period. World real GDP will drop in 2009, with advanced economies experiencing deep contractions and with emerging and developing economies slowing abruptly. Trade volumes are falling sharply, while inflation is subsiding quickly." (IMF WEO, April 2009, p. 1).

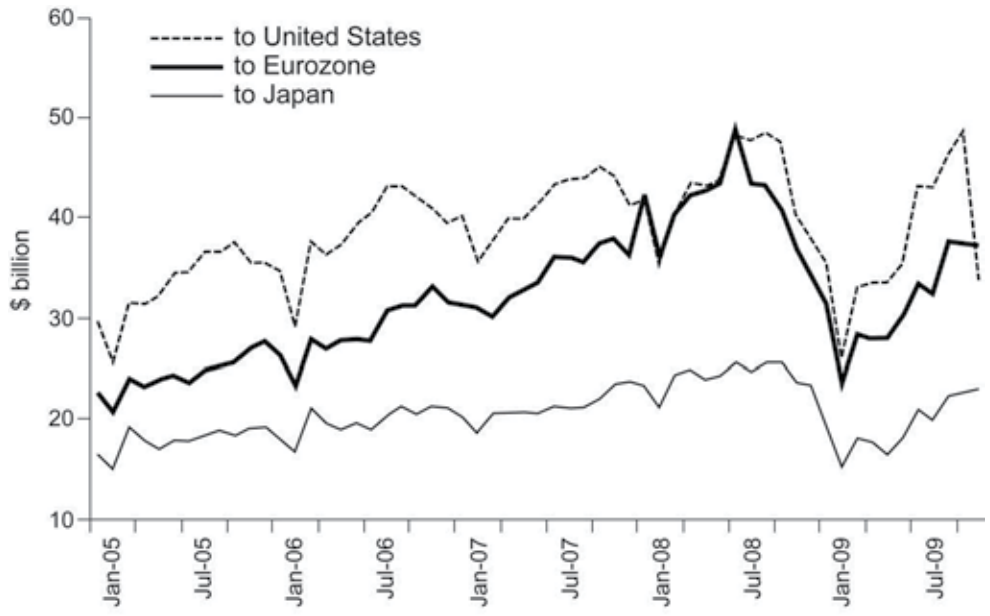
Immediate impact of the global economic shock on poverty, employment and food security

Until about mid-2009, the global economy was on a downward trajectory, with slowing economic activity and rising unemployment. From mid-2009 onwards, with China leading the way, there were signs of a global recovery. In this section we focus on the period of deepening recession from late 2008 when the global financial crisis erupted to the mid-2009 period.

The immediate impact of the shock was on net asset and commodity prices which drove down exports and trade volumes, and capital flows to developing countries. Capital inflows fell sharply, even reversing in some cases, as investors withdrew funds from emerging-country equity markets.

This was followed by the collapse of import demand from developed economies for both manufactured exports and primary commodities, which had a severe impact on Asian countries, with the more open export-dependent economies being the worst affected. Exports from developing Asia fell 24.5 percent in the first quarter of 2009, and were predicted at the time to fall a further 23.5 percent in the second quarter. The most dramatic impact was on Chinese exports: they fell for five straight months after the onset of the global financial and economic crises, falling by more than 50 percent overall. China was not alone in experiencing sharp export falls; throughout Asia, manufactured exports destined for markets in developed countries fell (Figure 33).[65]

Figure 33: Exports of developing Asia to major industrial countries, 2005-2009



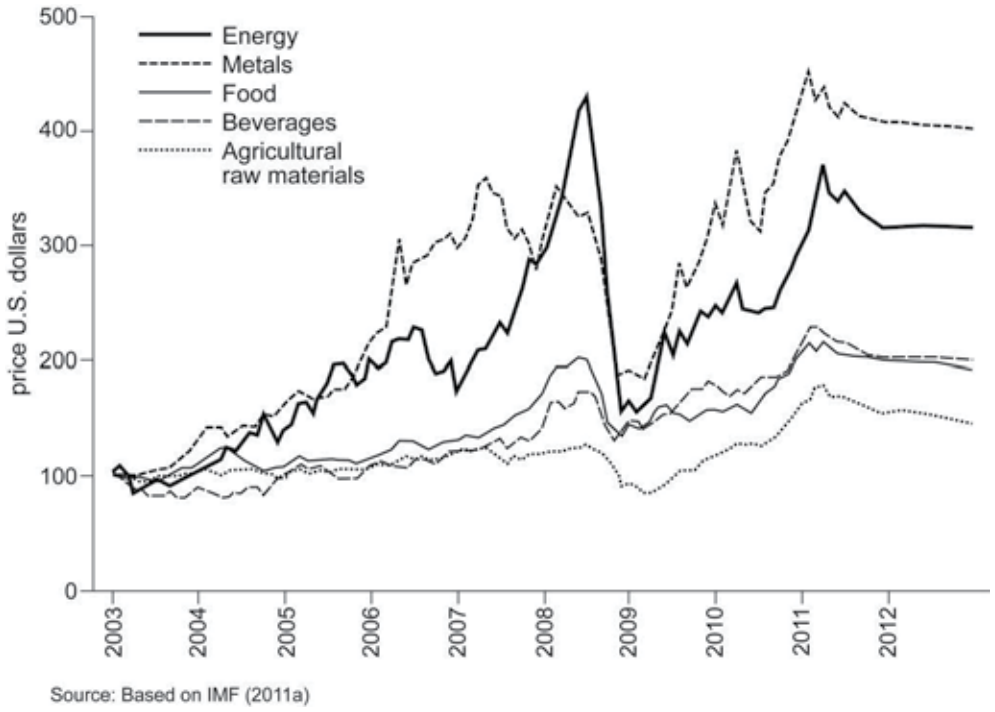
Sources: International Monetary Fund. Direction of Trade Statistics. http//www.imfstatistics.org/dot; CEIC Data Company (both accessed 8 April 2010)

Source: ADB (2010a)

[65] The sharp and immediate falls in demand for manufactured exports was driven by inventory adjustments of importing firms in the advanced economies, particularly in the United States of America, in expectation of a long and deep economic recession. For a discussion of this issue, see IMF (2010a), *World Economic Outlook 2010*.

Commodity prices, a barometer of global economic prospects, fell across the board (Figure 13).

Figure 34: Global commodity prices, 2000-2010



These commodity price falls had different effects on the study countries. While commodity-exporting Southeast Asian economies were losers from the broader falls in commodity prices, as net energy importers most Asian economies (with the exception of Vietnam) benefitted from oil price falls. South Asian economies, less reliant on commodity exports, were particular beneficiaries of oil price falls. For example, India and Sri Lanka both improved overall terms of trade in 2009.

Carrasco, Hayashi and Mukhopadhyay (2010) estimated that capital and financial outflows were quite substantial: US$ 9.6 billion for India and US$ 1.4 billion for Sri Lanka (a much smaller economy). Between October 2008 and March 2009 India lost 12 percent of its gross foreign reserves while Sri Lanka lost 60 percent of its reserves; their currencies depreciated by 12 percent and 17 percent respectively against the US dollar. In Vietnam, exports of goods and services, private remittances and foreign direct investment all slowed and the currency came under depreciation pressure (IMF, 2009, p. v).[66] The combination of capital outflows and falls in export revenues placed pressures on current account balances and exchange rates. Countries with weak foreign reserve positions faced liquidity shortages in the context of the global credit crunch.

Pessimism and loss of confidence among investors led to falls in both foreign investment and domestic investment. Across Asia, as elsewhere in the world, consumption, employment and economic growth slowed down. The immediate impact on employment was sharpest in the hard-hit export-oriented industries. Unemployment (and sometimes cuts in working days and

[66] Authorities responded by devaluation and by widening of the band, which allowed a further effective depreciation.

earnings) initially increased across export-oriented sectors of all our case study countries and then spilled over into other sectors.

China, the most dynamic exporter of the region, was also the hardest hit by the collapse of export demand. Huang and Rozelle (2010), in the China country study, estimated that 49 million workers (more than 20 percent of the rural labour force employed in off-farm employment) were laid off in China when the export collapse first occurred. While the overall impact of the global financial and economic crises on rural poverty was moderate, probably an additional 1.5 million to 2 million people were pushed into poverty. In India, which is less dependent on labour-intensive exports, there was only a modest increase in unemployment and a small fall in average monthly earnings. Kaur (2010), in her India country study, records that most of these job losses were in the unorganized (6 percent) sector of the export-oriented manufacturing industries, while job losses were minimal (0.3 percent) in the organized sector. The impact of the global recession was to reduce the rate of new employment creation rather than to push currently employed workers into unemployment. This impact was not insignificant, however; the economic slowdown (relative to trend growth) may have cost the economy 7-8 million potential jobs.

Indonesia, also a less trade-dependent economy, weathered the crisis better than most of its Southeast Asian neighbours, though its GDP growth slowed to 4.5 percent in 2009 from 6.0 percent in 2008.[67] Exports contracted from late 2008 to late 2009, with manufacturing and mining being the most affected, but unemployment did not increase.[68] Warr and Yusuf (2010) estimate that the overall impact of the global financial crisis (contraction of export demand and investment) on poverty and food security was probably larger than that of the food price crisis, reducing Indonesia's food-secure population by around 4 percent.

The Philippine economy was nearly stagnant in 2009 after a sharp slowdown in the last quarter of 2008. Exports decreased by 2 percent in 2008 and fell by another 13 percent in 2009. The official unemployment rate was virtually unchanged, although a number of establishments reported retrenchment of workers or closures. The displaced workers may have been absorbed in the other sectors. Surprisingly, the sectors that were initially thought to be adversely affected by the global financial and economic crises, the business process outsourcing and the remittance sectors, proved resilient. Based on counterfactual scenarios, Balisacan *et al.* (2010) estimated that the global financial and economic crises probably reduced average household incomes by 4 percent and that poverty incidence in 2009 increased by 2 percent.

The rice-exporting countries, Cambodia, Thailand and Vietnam, were hit by falling demand for manufactured exports as well as by falls in rice prices. In Thailand, manufacturing production and employment fell as exports contracted. Exports shrank (on a year to year basis) by 8.9 percent in the fourth quarter of 2008, 16.4 percent in the first quarter of 2009, 20 percent in the second quarter and an estimated further 16 percent in the third quarter. This was the worst slump in exports Thailand had experienced since 1960 and was even worse than during the 1997 Asian economic crisis (Figure 14). Overall economic activity fell further as tourism and construction also contracted.[69] In 2009, the Thai economy had contracted by over 2 percent. By the first quarter of 2009, unemployment was already up by 329 000, and another half million had reduced working hours (<20 hours per week). Real wages fell and poverty increased, with informal sector workers the worst affected. Rural households reported

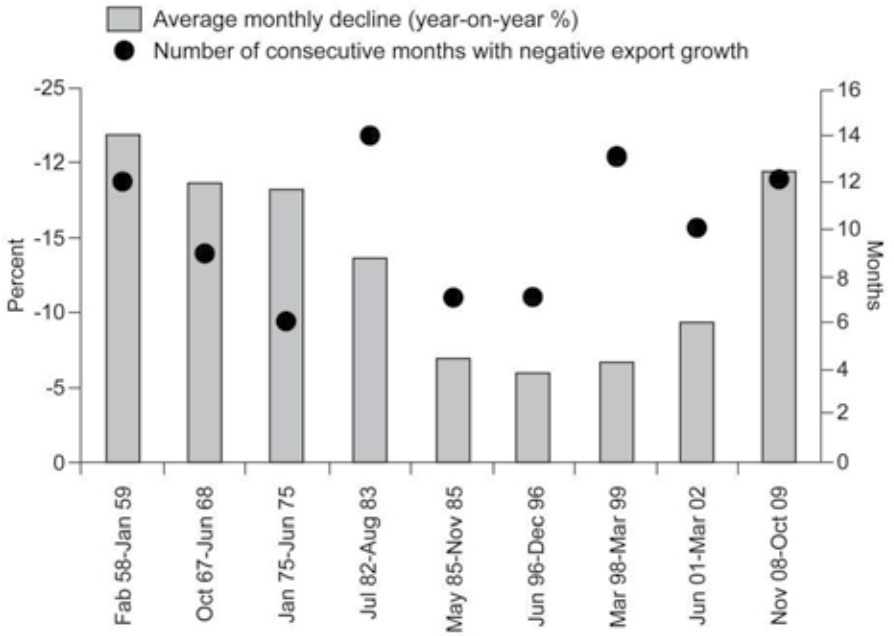
[67] This contrasts with the 1997/98 Asian economic crisis when Indonesia was the worst affected among these three countries.

[68] Unemployment in fact fell slightly between August 2008 and February 2009 (Resosudarmo and Yusuf, 2010).

[69] Tourism also fell but it is difficult to attribute that to the economic conditions alone, as political instability also played a major role.

reductions in remittance inflows, aggravating the impact of reduced farm incomes due to lower rice prices.

Figure 35: Thailand, 2009 − worst export slump since 1960



Source: World Bank (2010c), *Thailand Economic Monitor, June 2010*

Vietnam was highly exposed to the impacts of the global financial and economic crises, with its high export dependency (67 percent of GDP) and exposure to volatile capital movements. It had been one of the few countries to have benefitted from both oil and food price increases; it was now one of the few developing countries in the Asian region to have been quite badly hurt by the turmoil in global asset markets and the collapse in demand for manufactured exports, as well as by the fall in food and oil prices. Falling export demand for its labour-intensive manufactures resulted in many thousands of workers either losing jobs or being forced to accept reduced working hours, though overall unemployment did not increase as much as in the neighbouring countries.[70] The farming sector was hit by falling rice prices. As a result, Vietnamese GDP fell from 6.3 percent in 2008 to 5.3 percent in 2009, the slowest growth rate since 2000, despite a large stimulus programme. But Vietnam's growth rate was one of the best among its developing Asian neighbours.

The global financial and economic crises affected Cambodia quite severely through lower investment flows, falling rice prices and falling demand for other exports; the economy contracted by 2 percent in 2009. The export-oriented garment sector was strongly affected by the global recession. Jalilian, Reyes and Lun (2010) report that 52 000 jobs (out of 300 000) were lost in the garment-export sector in Cambodia between September 2008 and August 2009, and working days and overtime were cut. Between September 2008 and August 2009, the total monthly wage bill of the garment sector fell by 13 percent. The construction sector was also badly affected, with large employment losses. While total employment in these sectors was only a small fraction of total employment, the combination of depressed agricultural incomes and lower non-farm employment more than offset the consumer benefits from lower rice prices. Though Cambodia benefitted from falling oil prices, this did not have

[70] Coxhead (2010), citing CIEM (2009) and ActionAid/Oxfam (2009).

a significant direct impact on household incomes as domestic oil prices were largely delinked from international prices (pass through was only 6 percent).

In contrast, direct job losses were not so widespread in the more closed economies of South Asia, though export sectors were affected by the global slump in demand. Deb (2010) reports that jute factories in Bangladesh reduced production and employment, with several thousands of workers losing jobs; there were also reports of some job losses in the garment sector. The impact on the textile and garments sector, the key manufacturing export industry in both countries, was not as severe as initially expected. Though the rice-equivalent wage in Bangladesh fell during the period of the initial price increase, nominal (money) wages increased after some time because the economy was growing quite robustly, and the rice-equivalent wage was restored and when rice prices came down from the high levels, the real wage in terms of rice even increased because of the higher money wages.

In Sri Lanka, the overall unemployment rate increased only marginally, from 5.4 percent in 2008 to 5.8 percent in 2009 and the employment situation benefitted from the revival of economic activities following the end of the civil war in 2009. Nepal's economy was insulated from many of the global shocks by the Indian economy, and was affected more significantly by internal political developments related to the cessation of violent conflict. For Bangladesh, Nepal and Sri Lanka, which depend on remittances from workers employed in foreign countries for a large proportion of their net foreign earnings, it was also fortunate that remittance inflows held up well, though their growth rate declined.[71]

Thus, from late 2008 through mid- to late-2009, developing Asian economies went through a period of increasing and at times quite acute economic distress, with the more open economies being worst affected. Fortunately, this period of severe stress was of relatively short duration. The region as a whole experienced a quite rapid recovery from around mid-2009 onwards (see Table 2 and Figure 11 for post-2009 growth data).[72]

Policy responses and recovery: stimulus programmes and long-term food security

It is generally agreed that this recovery is attributable to the unprecedented size and scope of the global response to the global financial and economic crises. Aggressive and determined actions by governments throughout the Asian region, led by China and India, were a major component of that global response.[73] In most developed Western economies massive government interventions – 'bailouts' – saved the financial system from meltdown, and these were followed by large-scale spending ('stimulus') programmes. Every major Asian country, though not all on the same scale, took steps to counteract the adverse demand effects of the global financial and economic crises.[74]

[71] For a discussion of post-global financial and economic crisis remittance flows to these countries, see IMF (2010b).
[72] Some countries, such as Thailand, had a slower recovery due to country-specific factors.
[73] IMF (2010a).
[74] It is difficult to assess how much of the extra economic stimulus provided by government policies was motivated by the need to counteract the impact of the global crises. In 2008, for instance, many countries undertook fiscal measures to assist households affected by high food prices, while Nepal implemented significant expansionary spending as part of the political settlement following the end of the war. In 2009, the Sri Lankan government undertook a large-scale spending programme following the end of the civil war and the elections that followed the military victory of the government.

The extent to which each country was affected by the shock depended on its economic structure and, in particular, its openness and integration with global markets.[75] The nature, composition and impact of the stimulus programmes adopted by the various countries to respond to the crisis also differed greatly, reflecting in each case the size of the shock to the country, the fiscal capacity of the government and the political economy setting.

The Chinese stimulus programme was the largest in Asia and, from a regional and global perspective, had the biggest impact.[76] Its swift and massive policy response turned around the Chinese economy so that in the second half of 2009 the average annual growth rate reached 9.1 percent. This growth momentum continued in 2010, when the economy grew 10.3 percent. Chinese (and Indian) growth also had important spill-over benefits for the region and the world (IMF WEO April 2010). A feature of the Chinese stimulus programme was its emphasis on infrastructure investments, rather than on social safety nets. About 10 percent of the central government stimulus spending was on rural development, including rural infrastructure, enabling re-employment of millions of rural workers who had lost jobs and incomes in the immediate aftermath of the global financial and economic crises.

India had three fiscal stimulus packages, announced between December 2008 and February 2009, amounting to about 3.5 percent of the GDP (with an additional stimulus of about 1.3 percent of GDP coming from measures taken to offset the effect of the increase in the prices of oil and fertilizer imports). The programmes were smaller compared with those in China and had a weaker emphasis on investment, with more spending on income support measures. Some of the stimulus measures took the form of cuts in service tax, excise duty and countervailing duty on imports, supplemented by further sector-specific measures for textiles, housing, infrastructure, automobiles, micro and small sectors and exports and investment finance. The composition of the programmes did not have a specific agricultural focus; indeed, the programme has been criticized for not providing adequate assistance to agriculture in areas of acute need such as irrigation, rural power and storage facilities (including cold storage).[77]

In Indonesia, whose economy was less severely affected compared to the more open neighbouring Southeast Asian economies, the stimulus programmes were more restrained. A fiscal stimulus was announced in 2009 with tax cuts to stimulate spending, favourable tax incentives for infrastructure projects, and some 'social expenditures' (various forms of transfers to households). The implemented fiscal stimulus measures fell short of what had been announced earlier (the actual deficit was only 1.6 percent of GDP compared with a projected 2.5 percent).[78] Warr and Yusuf (2010) suggest that the overall impact of the programme was not large enough to offset the effects of the crisis on food security and that

[75] We do not attempt to assess the overall effectiveness of the policies undertaken by each government to address the challenges of coping with the crisis, or the well-known and widely debated issues over the long term viability and consequences of the stimulus programmes. These issues are of great importance but they are not the primary concern of our study. The size and composition of the packages are difficult to estimate very accurately, so that the figures given and conclusions drawn should be treated with caution. Interested readers are directed to ADB (2010a and 2010b), IMF (2010a and 2010b) and UNESCAP (2010) for useful overviews.

[76] While there is disagreement about the magnitude of the overall stimulus programme, the central government programme is generally considered to be of the order of about 13% of GDP. But this may considerably underestimate of the magnitude of the total package, if provincial level programmes – which are known to be quite large – are also taken into account.

[77] For instance, according to a statement by the Director of Indian Council for Research on International Economic Relations, the stimulus programmes had completely left out agriculture (http://www.indianfarmers.org/news_singlepage/agricultural_compleatly_articles.html.

[78] The impact of the fiscal stimulus measures were likely to be limited because (a) most poor households do not pay income tax and (b) eligibility criteria for infrastructure investments to gain tax benefits were quite restrictive (Patunru and von Luebke, 2010).

the fiscal stimulus package placed no emphasis on agriculture as a sector or to the improvement of agricultural productivity. Another significant boost to overall spending came from election spending in 2009, which may have helped to soften the impact of the global financial and economic crises on household incomes, and helped the Indonesian economy to come through 2009 with only a modest slowdown (Resosudarmo and Yusuf, 2009).

In early 2009 the Philippine government announced a stimulus package, the Economic Resiliency Plan, which included pump-priming activities to generate employment.[79] The initial announcements were for a programme amounting to 4.1 percent of GDP of which a substantial portion was to be funded by government and private financial institutions. However, there were changes to announced programmes and Padilla (2009) estimated that the extra stimulus expenditures finally amounted to only a little over half of one percent of GDP. Meanwhile, existing safety net programmes were given increased funding in order to increase coverage.

Thailand and Vietnam, both affected strongly by the global financial and economic crises, undertook expansionary fiscal stimulus programmes. In the case of Thailand, internal political instability exacerbated the impact of this external shock. Immediately following the global financial and economic crises, Thailand undertook a stimulus programme estimated at about 2.4 percent of GDP in 2008/09.[80] In 2009 the government announced two fiscal stimulus measures, one to take effect immediately (1.1 percent of GDP), to be followed over the period 2010 to 2012 by further large stimulus measures (over 17 percent of GDP).[81] The first stimulus programme was focused on assisting badly-affected sectors and households, while spending in the following programmes was to be devoted primarily to infrastructure projects – particularly in transport and water – which would improve Thailand's food production capacity and overall agricultural output.[82] But the stimulus measures in 2009 were unable to fully counteract the external and internal shocks faced by the Thai economy and the Thai economy contracted by 2.3 percent in 2009. However, the economy recovered strongly in 2010.

The Vietnamese government responded to the shock of the global financial and economic crises with a strong stimulus programme (around 10 percent of GDP).[83] This programme was a mix of credit expansion, tax rebates and exemptions, and direct increases in government spending.[84] The first stimulus package earmarked the bulk of expenditure for infrastructure and development projects, and included a package of measures to support agriculture, including interest-free loans for investments and interest-rate subsidies for working capital (fertilizer and other inputs). The second programme extended interest-rate subsidies to agriculture, export-oriented firms and labour-intensive industries through the end of 2010, albeit at a lower rate than the subsidies announced earlier in the year. The construction sector, benefitting strongly from the stimulus measures, showed strong growth in 2009, while the agricultural sector also maintained positive growth. The export decline, at less than 10 percent in 2009, was moderate and the smallest among neighbouring countries such as Indonesia, Malaysia, the Philippines and Thailand as well as China. As a result Vietnam was able to maintain overall positive growth in 2009 – at the quite satisfactory rate of 5.3 percent –

[79] See NEDA (2009) for summary.
[80] IMF (2009c).
[81] The World Bank (2010c).
[82] However, it is noted that a high proportion of current spending on the food sector goes to price support (in place since the decline in world rice prices) and has been a significant drain on the government budget.
[83] There were two formal announcements of stimulus packages, one in the second quarter of 2009 and another in late 2009. It is difficult to assess the precise magnitudes of the size of the stimulus and the fiscal deficit because of issues with 'double counting' and lack of transparency (World Bank, 2010d).
[84] See Coxhead and Linh (2010) for more details.

though the economy had slowed down markedly in late 2008 and early 2009. The stimulus programme had clearly succeeded in restoring growth and avoiding increased poverty and food insecurity in the short term. But it came at a cost: significant macroeconomic imbalances emerged, with a widening trade balance, a large payments deficit and downward pressure on the currency.[85]

Cambodia was also quite seriously affected by the global financial and economic crises, but lacked the fiscal capacity of its larger neighbours to respond in similar fashion. Nevertheless, it also took some steps to help export sectors, including agriculture, which were badly hit by the global financial and economic crises, and also implemented a range of social safety net programmes and transfers to cushion the impact on households. The government also announced that it would pay greater attention to agriculture. It created an Agriculture Support and Development Fund, proclaimed a three-year tax holiday for agricultural investment projects, and suspended tariffs and value-added tax on agricultural inputs. In 2009 it undertook a significant fiscal expansion, but very few additional funds were allocated to agricultural investments. Even in the 2010 budget, there were no significant increases in investment spending on agriculture or related activities.[86]

The smaller economies of South Asia, being relatively less affected than Southeast Asia and East Asia by the global financial and economic crises, and with smaller fiscal capacity to undertake major fiscal initiatives, had much smaller stimulus programmes.

Bangladesh's first fiscal stimulus programme announced in April 2008 was small (0.6 percent of GDP) and focused on export sectors but also included spending on higher safety net expenditures, more agricultural support and input subsidies (spending on fertilizer subsidies, seeds of high yielding varieties (HYV) and storage capacity, agricultural machinery and agricultural finance).[87] A subsequently- announced programme (about 0.9 percent of GDP) expanded support for subsidies and incentives, with a substantial proportion being allocated for boosting agricultural production and processing. While the overall size of the fiscal stimulus was not very large, these measures appeared to have had some impact on food production and in assisting poor households to meet food needs.

Sri Lanka's stimulus programme was also relatively small (in total about 0.6 percent of GDP) and targeted the export sectors (including important agricultural commodities, tea and rubber, as well as the garments sector), with measures to provide direct price supports, fertilizer subsidies and further assistance to the garment export industry.

Nepal did not launch stimulus programmes specifically in response to the impact of the global financial and economic crises but continued with expansionary fiscal measures adopted earlier in 2008, with a primary focus on safety net and social security needs and longer term issues of energy, governance, etc.

In summary, the region not only avoided the feared economic catastrophe from the global financial and economic crises but made a remarkably quick and strong recovery after a short

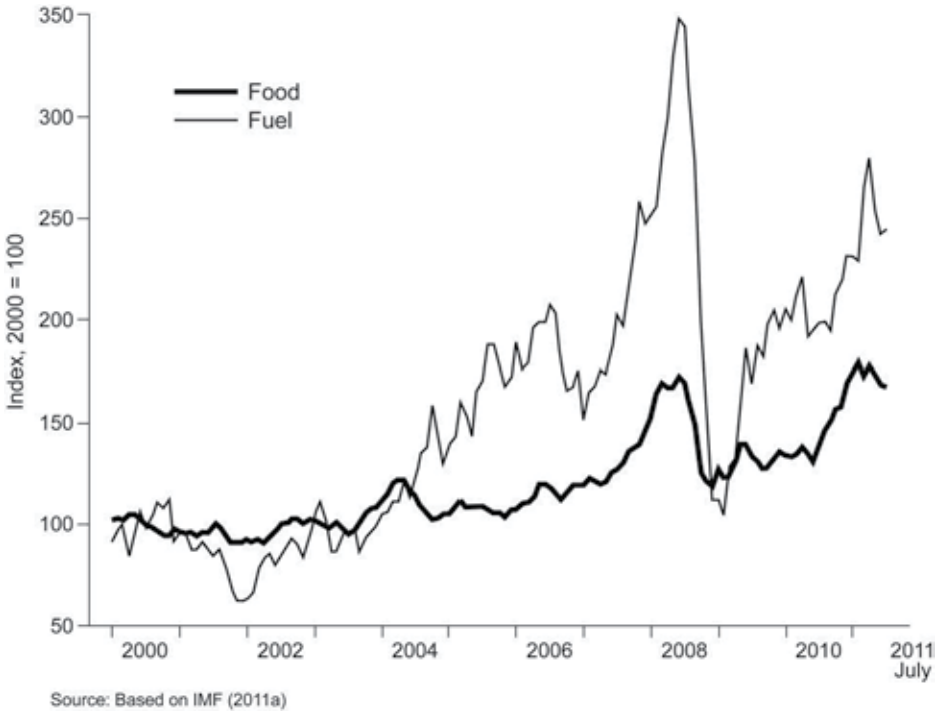
[85] The fiscal deficit widened from 4.1% of GDP in 2008 to over 11% in 2009, and the exchange rate has come under serious pressure (IMF, 2010c, World Bank, 2010d).

[86] According to Jalilian, Reyes and Lun (2010, p. 22), "...available details about the 2010 budget law passed at the end of 2009 indicate no notable ramping up of public expenditure on agriculture despite the alarm sounded by the food crisis. In the almost US$2 billion budget programmed for 2010, defence has a share of 14 per cent, while agriculture and rural development have meagre shares of 1.7 per cent each (*Phnom Penh Post*, 2 December 2009, p. 2)."

[87] See Carrasco, Hayashi and Mukhopadhay (2010) for a discussion of macroeconomic issues related to the fiscal stimulus in South Asia.

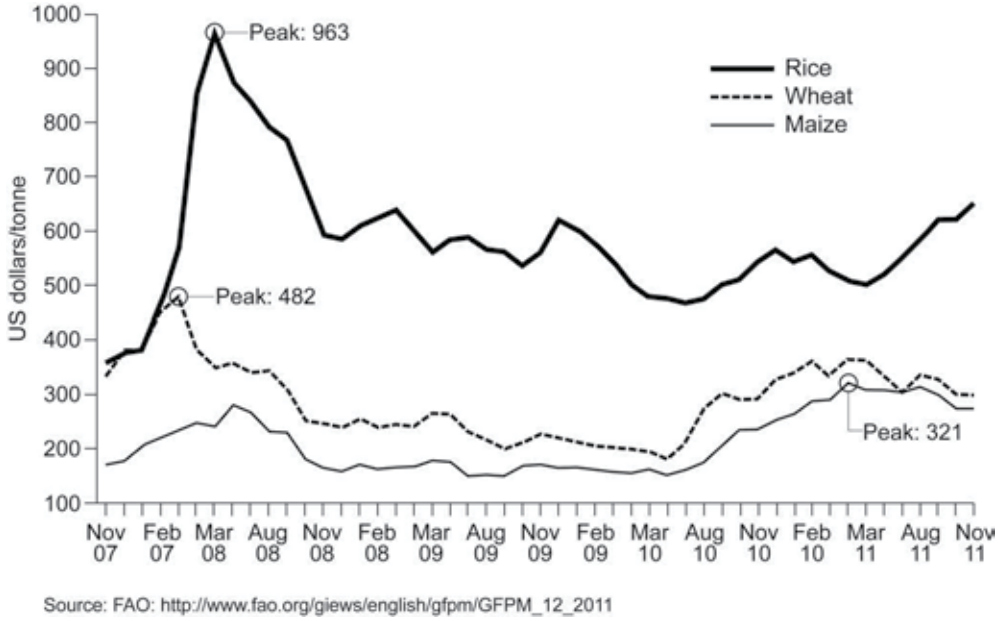
period of stress in the immediate aftermath of the global financial crisis. As a result the region was able to avert the feared sharp increase in poverty and food insecurity. The stimulus programmes played an important role by ensuring that aggregate demand, employment and incomes were (at least partially) restored after the initial slump. While sharing the overriding objective of providing a quick lift to domestic demand, these programmes differed in size and composition. In some countries, such as China and Vietnam, they had a stronger investment bias, but in others, such as India, they focused more on providing assistance to maintain current incomes and production. But as the economic recovery gathered momentum, food security issues resurfaced with a second price spike in 2010/11 that raised international food prices (and fuel prices) close to 2007/08 levels (Figures 15 and 16).

Figure 36: Food and fuel prices − the second spike



Source: Based on IMF (2011a)

Figure 37: and wheat prices − November 2007 to November 2011



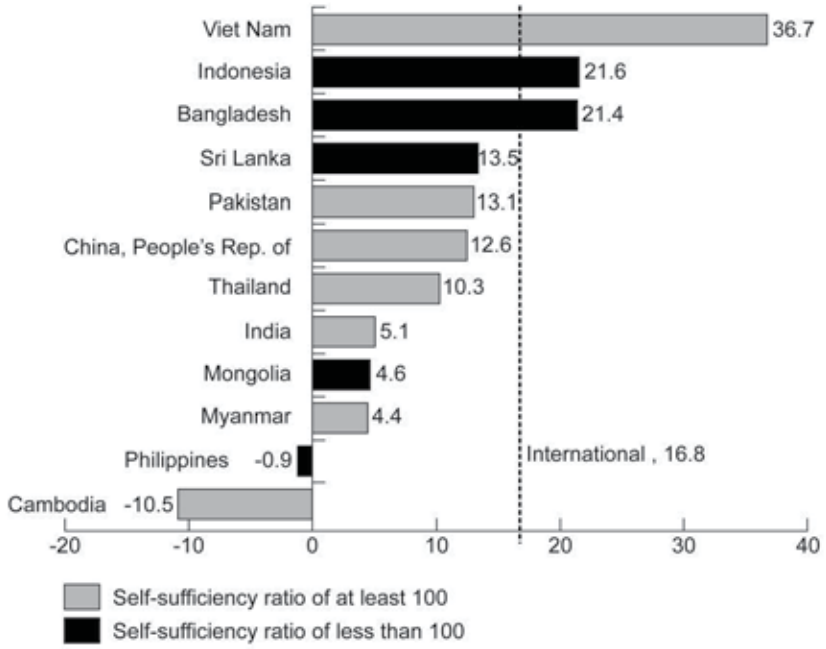
Source: FAO: http://www.fao.org/giews/english/gfpm/GFPM_12_2011

Some of the same long-term factors that underpinned the pre-2008 price increases, in combination with some cyclical factors, weather events and policy measures taken by major exporters, including the wheat export ban by Russia, were responsible for this second price spike. [88]

Again, though these international prices were not fully transmitted to domestic prices, many Asian countries experienced substantial domestic price increases from 2010 until late 2011, after which prices began to ease again (Figures 38 and 39).

[88] See the various FAO publications such as the Global Food Price Monitor, Food Outlook, Crop Prospects and Food Situation for discussions of the evolution and causes of the second price spike. ADB (2011b) and Carrasco and Mukhopadhyay (2012) also provide useful discussions of the recent global and Asian food price inflation.

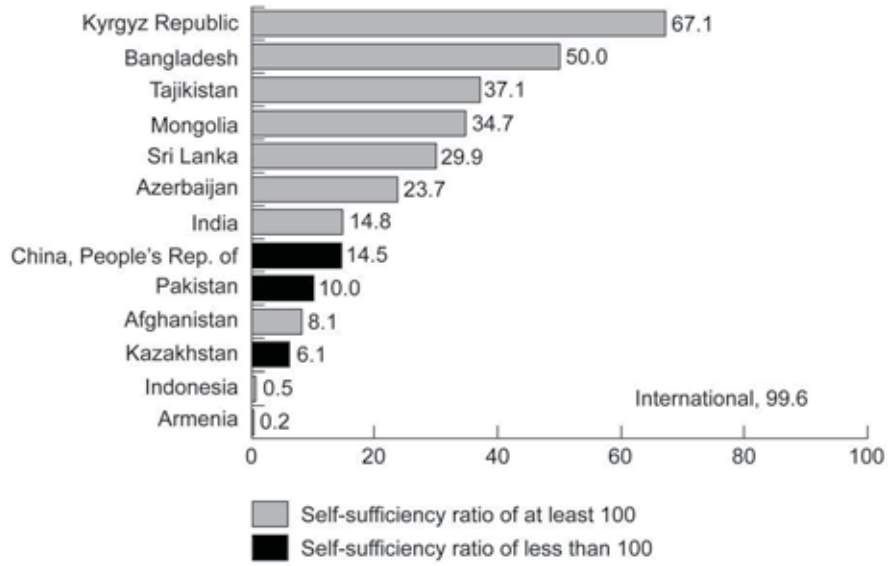
Figure 38: Rice − increase in domestic price since June 2010



Note: Self-sufficiency ratio refers to production relative to domestic utilization (ie., production + imports - exports). Ratios refer to the 10 year average from crop years 2001/2002 - 2010/2011. Changes refer to June-October 2010 for Myanmar; June-November 2010 for Philippines; June-December 2010 for Thailand; June 2010-January 2011 for Cambodia, Indonesia and Mongolia, and June 2010-February 2011 for Bangladesh, the People's Republic of China, India, Pakistan, Sri Lanka and Viet Nam.

Source: ADB (2011)

Figure 39: Wheat − increase in domestic price since June 2010



Note: Self-sufficiency ratio refers to production relative to domestic utilization (i.e., production/[production + imports - exports]). Ratios refer to the 10 year average from crop years 2001/2002 - 2010/2011. Changes refer to June-December 2010 for Kazakhstan and Tajikistan; June 2010-January 2011 for Armenia, Azerbaijan, Bangladesh, Indonesia and Mongolia; June 2010-February 2011 for Afghanistan, the People's Republic of China, India, the Kyrgyz Republic, Pakistan and Sri Lanka.

Source: ADB (2011)

It is noteworthy that rice price inflation was particularly high in countries such as India and Indonesia, which had used restrictive non-tariff trade policy measures to insulate domestic prices from international prices. The higher inflation may be a consequence of the fact that such trade restrictions convert food into a non-tradeable product; expansionary economic policies that stimulate demand or domestic supply shocks can then result in domestic price increases higher than international price increases.[89]

It is difficult to predict whether the current turmoil in the global economy, the slowdown in key Asian economies – particularly China and India – and the recent softening of commodity prices may be early warning signs of an even deeper global financial and economic crisis than that following the financial crisis of 2008. But what this second food price spike clearly indicates is that underlying pressures in the global and national food markets can rapidly precipitate a full-blown food price crisis. The next section looks at drawing some of the main lessons from the experience of the food price crisis and the global financial and economic crises that may have useful implications for formulating policies and strategies to cope with the uncertainties of a fragile global financial, economic and food system.

[89] The comparison of international and domestic price increases in the above Figures do not seem to be based on the price movements measured in a single common currency and there are references in the body of the ADB report to deviations between price movements being due partly to currency appreciations and depreciations.

7. Government policy responses: effectiveness and rationale

The Asian region, which contains the majority of the world's poor and malnourished people, faced three major economic shocks since 2007 – the food price spike of 2007/08, the global financial and economic crisis, and then the second food price spike of 2010/11 - that had the potential to have a devastating impact on the food security of millions. In late 2008, analysts were predicting a massive increase in the number of hungry people in the world, with the largest increases projected to come from Asia. By the end of this period, although hundreds of millions of people continued to be hungry and undernourished, there was an almost audible sigh of relief that the worst case scenario had been avoided: the increase in food insecurity in Asia turned out to be considerably less than feared, expected and projected in early 2008, despite a second price spike in 2010/11. In that sense, the Asian countries certainly coped well with the food price and economic shocks.

In this section, we briefly summarize 'what countries did' and then address the question, 'why did they do what they did?' We start with the main government policy responses to the food price crisis, attempting to discern the key characteristics and drivers of individual country policies and any common patterns.

Coping with the food price crisis

As stated earlier, the impact on national income of a price increase in international markets was positive for net food exporters and negative for net food importers. This would suggest that policy responses would differ most markedly between net food importers and exporters. However, it is not easy to classify the study countries into two such clearly demarcated groups. Food is a composite bundle of commodities and most countries import and export different kinds of food products, whose value – and hence the net trade position of the country – can vary not only with year to year variations in supply and demand but also with international prices. This was most clearly the case with China, one of world's largest food traders, but it also applies to several other countries.

Based on the country studies, it appears that even countries with large exportable surpluses of the staple cereals relative to their domestic consumption needs showed significant differences in policy responses. Hence a three-way classification of 'large net food exporters', 'marginal net food traders' and 'consistent net food importers' appears to be more useful. In such a classification, the two 'giants', China and India, are both best described as marginal net food traders, together with Indonesia and, perhaps, the Philippines. On the other hand, Thailand and Vietnam (and possibly Cambodia) are large net food exporters, while the smaller economies, Bangladesh, Nepal and Sri Lanka are consistently net importers, though as pointed out earlier, overall import dependency (at least for rice) is generally not very high.
The policy measures adopted by the three groups of countries to cope with the food price crisis – whose origin, as emphasized several times earlier, lay in international markets – can be discussed in the context of the incentives and constraints they faced. In almost every country the food crisis encouraged governments to emphasize the need for higher food output and productivity, and there were programmes to provide public assistance to poorer households affected by high prices.

While the package of policy responses varied from country to country, every one of them used – or was ready to use – trade policy interventions of one sort or another. Indeed, trade policy interventions were the primary form of intervention and were by and large quite effective in stabilizing prices in most countries. This meant that generally countries did not have to undertake major expansions of other forms of consumer assistance, although some measures and targeted assistance programmes were undertaken, particularly in countries such

as the Philippines where the food price increase was substantial despite the stabilization measures. We focus on the trade related interventions in this discussion.

Large marginal trader countries: China and India

For these countries, domestic demand is large and food trade is marginal to their economies. Their policy responses to these international shocks were determined by internal food security and related political economy considerations.

China and India, both of which have substantial buffer stocks, imposed export restrictions, including bans, when domestic prices of their (marginal) food exports started to increase in line with international prices. This had the overriding attraction of preventing a steep (though temporary) internal price increase by immediately breaking the link between internal prices and sharply rising international prices at negligible fiscal cost. Release of buffer stocks into the domestic market might not have been able to stabilize domestic prices quickly, given the incentives to export. In principle, alternative instruments, such as safety nets of various types, including targeted income transfers, could have maintained food security of vulnerable groups. But such programmes require substantial planning and efficient administrative mechanisms and even when a system is in place – such as the public distribution system in India – it is difficult to avoid a sharp price surge when there is free international trade in food. Though such a price surge is unlikely to last long, because higher exports induced by those prices will push world prices down, governments are understandably reluctant to deal with even a brief period of very high prices.

Under the circumstances, an export ban is appealing to governments because it has the virtues of having immediate impact and being easy to impose and enforce, with virtually no fiscal implications. Importantly, such export bans and restrictions did not directly violate any World Trade Organization (WTO) rules or binding international agreements.[90]

Of course this policy is not entirely costless. A country imposing such bans and restrictions loses export revenues and its reputation as a reliable exporter (although this is less significant because cereal exports are a small fraction of total exports). Farmers are deprived of the opportunity to gain from high international prices and this has longer term effects. In addition, the damage to the international trading system should not be entirely ignored; after all, marginal exporters sometimes need to access international markets in the event of a domestic supply shock. But from a short-term national government perspective, it is not difficult to understand why governments of large, marginal exporter countries are likely to impose export restrictions.

Large importer countries: Indonesia and Philippines

Importer countries do not have ability to cut imports during times of high international prices, unless they have very large stocks in reserve. If they want to maintain domestic price stability they have to provide subsidized imports to domestic consumers. Hence the capacity of importer economies to maintain low domestic prices depends critically on their fiscal position. In the case of the Philippines, the country accepted the large fiscal cost of importing rice, built up stocks and provided subsidized food. This stands in contrast to China, where, despite its fiscal strength, after imposing export restrictions and stabilizing domestic prices of the major staple grains, the government let domestic soybean prices go up rather than finance large amounts of subsidized soybean imports.

[90] This would have been different if there were export taxes bringing large tax revenues.

Indonesia has been used as an example of how trade policies, buffer stocks and incentives to domestic producers can provide internal price stability.[91] When international prices spiked, Indonesia did not need new trade policy measures to insulate internal prices from international price movements. Fortunately, during this period it did not experience any domestic supply shortfalls and the Indonesian government did not have to import large quantities of rice to maintain internal price stability. But as discussed earlier, this policy involved a trade-off: Indonesia avoided short-term price spikes by imposing 'permanently' higher prices during 'normal' times.[92]

Smaller importer countries: Bangladesh, Nepal, Sri Lanka

In the case of smaller economies, domestic political economy considerations, subject to fiscal constraints, also drove policy. But because of their size, their restrictive trade policy measures had no significant impact on world markets. During the food price crisis, Bangladesh and Nepal benefitted from their *de facto* integration with the Indian market and from Indian export restrictions which kept internal Indian prices low. Bangladesh also supplemented its supplies with official imports from India and elsewhere, thus easing internal price pressures.

Sri Lanka's policy behaviour during the food price crisis showed a pattern of frequent changes, responding in turn to pressures from producer and consumer interests. Historically, Sri Lankan governments have resorted to trade policies to offer protection to producers when international prices were low and eased restrictions and facilitated imports when internal prices rose above politically acceptable limits. But this response was inadequate when international prices rose sharply at a time when domestic prices were also rising. The government relied on the social safety nets in place and on heavily subsidized imports to meet food security objectives, but the financial burden of this policy would have become very difficult to sustain if the food price increases had persisted for a longer period.

Rice exporter countries: Thailand, Vietnam and Cambodia

Thailand and Vietnam, the major established rice exporters, benefitted from higher export revenues due to high rice prices. Large exporters in a tight market face a trade-off: on the one hand they do not want to disrupt exports, so as to maintain their reputation as reliable suppliers; on the other hand, because they have market power, they can make substantial short-term gains if they impose some export restrictions, thus driving up prices for their exports. Export restrictions also lower domestic consumer prices.

Thailand opted not to disrupt exports and refused to impose export restrictions. Thailand had the highest per capita income among all the study countries, and rice was a smaller part of the food consumption bundle. Though the Thai government did not undertake any direct measures to lower the internal rice price it did introduce various measures to try and reduce the impact on the poor, such as subsidies for diesel, water, electricity and bus and train services (although it is not clear if they did in fact, help the poor).

In contrast, Vietnam, though it did not impose a ban of exports, stopped new export contracts. As Vietnam's rice export trade is dominated by two state trading companies, there may also have been a fiscal motive for some short-term strategic behaviour with respect to exports. As can be seen in Figure 13, these measures were not very effective in stabilizing domestic prices, which tended to increase in tandem with international prices. We can discern some common themes in these various policy responses.

[91] See Timmer (1996, 2002).
[92] See patterns of nominal rates of protection in Anderson and Valenzuela (2008).

As described, export restrictions were effective in insulating domestic prices in China and India. In the case of Bangladesh and Nepal, domestic price insulation was achieved largely indirectly, as a by-product of the policy actions of India, with whom they share a porous border. Indonesia more or less maintained its pre-existing restrictions, which had already insulated the domestic market from external price movements. The Philippines and Sri Lanka, net importers, purchased and distributed subsidized imports to stabilize domestic consumer prices.

In Vietnam and Cambodia, rice exporter countries, governments were prepared to impose some export restrictions but these were not very effective in stabilizing domestic prices. Thailand, their neighbour and a major rice exporter, did not restrict exports in any way, and enforcing effective restrictions on cross-border rice trade with Thailand would have been very difficult if there were large price differentials between them. As in the case of India, Bangladesh and Nepal, there appears to be substantial *de facto* integration of the rice markets of Thailand, Vietnam and Cambodia. This meant that Vietnam and Cambodia had only limited capacity to insulate their domestic rice markets from international markets when Thailand practised free trade.

These observed policy responses to the food price crises can be best understood as the product of a political balancing act, subject to fiscal constraints and broader national income objectives. Policies were implemented to reduce internal price volatility and maintain price fluctuations within a 'band', whose somewhat elastic lower and upper limits are set in response, on the one hand, to supply-side interests (farmers/millers) and, on the other, to consumer interests.[93] These twin price targets imply policy interventions which swing between protection and taxing of the food sectors.[94]

In summary, while the policy options open to countries depended on their specific circumstances, the objective of domestic consumer price stability was a major driver of policy in most countries. The only exception was Thailand, which had the highest per capita income, the lowest share of rice in the average household expenditure basket and the most to lose by imposing export restrictions given its long established reputation as a reliable supplier.

Coping with the global financial and economic crises

As described in previous sections, the initial impact of the global financial and economic crises was particularly severe on Asia as a region, but it was also the earliest region to recover. Every country experienced slower growth – sometimes negative growth – as global demand fell, investment flows slackened and faltering confidence led to lower domestic private investment, exacerbating the effects of lower international investment flows. Unemployment, underemployment and poverty increased. Thus the last quarter of 2008 and the first half of

[93] The political weights of consumers and producers differ not only between countries but also change over time as economies develop and structural changes occur.

[94] This type of insulating behavior using trade restrictions at the 'borders' as well as other policy instruments is not new; it is similar to how many governments have responded to previous food price surges and falls, such as in the 1972-1976 and 1986-1988 periods (Anderson and Nelgen, 2010). Historically, there has been a pattern of price and other support for high-cost domestic producers in net importer countries who lacked natural comparative advantage and required protection (See Anderson and Martin, 2009, for a discussion of the changing political economy of agricultural policies in Asia). The manner in which politically acceptable price bands shift is seen in the case of Indonesia: the Indonesian government that came to power after the fall of the Suharto dictatorship implemented a rice import ban policy when the new democratic electoral system gave farmer groups greater political clout.

2009 were periods of substantial economic distress for many poor households throughout the region. If the conditions that prevailed in the early 2009 period had been prolonged, the outlook for poverty and food security would have become grim across the region.

Fortunately, the negative effects of the global economic downturn were relatively short-lived; from mid-2009, economic recovery gathered momentum and by 2010 the region appeared to have nearly returned to the pre-crisis growth trajectory.

But the impact of the crisis, and the nature and effectiveness of policy responses, varied a great deal from country to country. Countries that were highly integrated with and exposed to the global economy experienced the most severe impact. Thus South Asia, a relatively more closed region, was less affected than East Asia. Thailand, a more open economy, was hit harder than Indonesia, a less open economy. The differences between countries such as China and India were more pronounced, while important similarities were observed between countries such as Cambodia and Bangladesh, which share long porous borders with larger neighbours and are also highly dependent on labour-intensive garment exports and worker remittances. As oil and food prices eased, food exporters lost export revenues and most countries in the region, other than Vietnam, benefitted from lower oil prices. Lower fertilizer prices also benefitted most countries. The impact of the international price falls were felt mostly at the country level as in most instances pass through of both food and oil prices was quite small.

Our country case studies show that the worst case scenario of sharp increases in poverty and food insecurity following the global financial and economic crises was moderated or avoided altogether. Overall, the Asian region did not experience any extensive and prolonged unemployment and income shocks that could have threatened food security.

It was not possible to assess within the time and resource constraints of this project the extent to which individual country policy responses contributed to this relatively benign macroeconomic outcome. But it is noteworthy that the global financial and economic crises did not produce any serious banking and financial sectors crisis in the region or precipitate an exchange rate or balance of payments crisis. This contrasts with the 1997 East Asian financial crisis period, and is attributable at least in part to lessons learned from the 1997 crisis (more flexible exchange rates, improved financial sector regulation and supervision, higher foreign exchange reserves, limited capital account liberalization in most countries, generally more prudent fiscal policies, etc.).

While almost all countries implemented some type of a stimulus programme, it was the Chinese stimulus programme that played the major role in stabilizing demand conditions in China and also contributed to the regional and global recovery.[95] The scale and impact of the Chinese intervention was only possible because of its huge past savings and strong fiscal situation. Regional economies were bolstered by high Chinese import demand for both resources and manufactured parts and components. While the majority of regional imports were for use in exports to developed-country markets, in a sign of rebalancing within the Chinese economy, an increasingly larger component of this demand is now destined for domestic utilization.

The Indian stimulus programme, which was on a more limited scale, was designed to address the more moderate impact of the crisis on the Indian economy.[96] Its cross-border effects were also commensurately more modest.

[95] See, for example, IMF (2010a).
[96] In any case India's weaker fiscal situation constrained its capacity to undertake a larger programme.

The global recovery that was visible from mid-2009 onward helped all Asian economies, and the more trade-dependent economies in particular. Towards the end of 2009 all of them were experiencing better export performance and by early 2010 economic growth had resumed and there was renewed optimism about the future. The 2010/11 food price spike came in this context of general economic growth and caused concern but no panic in the region.

But at the time of completing this report (mid-2012), with reports of slowdown in both China and India, the troubles in the Eurozone and weak employment figures in the United States of America, the troubled global economy is again casting a long shadow over the prospects for sustained recovery and poverty alleviation. It is imperative that we use the lessons of recent experiences and prepare to confront the challenges of an unstable global economy and prospects of renewed threats to food security,

Policy challenges

After two decades of quite stable prices, high prices and volatility have come back at a time of great turbulence in the global economy and in broader commodity prices. The issue is not simply one of price volatility but also the level of prices. As the recent HLPE report also noted: "Price volatility also interacts with price levels to affect welfare and food security...

This interaction implies that focusing only on price spikes will not address overall welfare consequences." (p. 9). This means global and national action is required to address the long-term food security challenge of increasing global supplies to feed an expanding population in an environment where the food production resource base is threatened by climate change, water scarcity and land degradation. One reason why the 2007/08 price surge was such a big shock was because the previous two decades had seen unusually low food price volatility, around a declining trend in real prices. What was forgotten by both many national governments and the international community was that this benign outcome was the result of the huge global effort that went into enhancing food production after the crisis years of the 1970s.

From today's vantage point it is easy to be critical of the analysis, estimates and projections made during the price spikes and global economic shocks since 2007, but our analysis leaves no doubt that the sharp food price spikes and the global financial and economic crises of 2007/08 and 2010/11 had the potential for severe increases in food insecurity, and should be recognized and described as genuine crises. The first price spike in particular was a large and quite unexpected shock and a catastrophic outcome was averted only because of prompt national and international action.

It certainly helped that the first food price crisis occurred during a period of rapid and robust global and Asian regional economic growth. It was also fortunate that no major domestic supply shocks occurred in any of the major Asian countries. Rapid economic growth meant higher household incomes and faster poverty alleviation, and enhanced the ability of households to cope with food price increases. Strong growth in the previous period, the vibrant global economic environment and general optimism about future growth prospects gave governments greater fiscal capacity to assist affected households and shield them from the full impact of higher international food prices. But without strong policy responses, the outcomes could have been far less benign.

Coping with these crises was not costless. Measures to cope with the food – and energy – price hikes included direct or indirect subsidization of food and energy which, added to extra spending on the stimulus programmes, resulted in large fiscal burdens for importing country governments. For example, the government had to bear losses of around US$ 1 700 million

incurred by the National Food Authority of the Philippines (the state agency in charge of rice storage and public distribution) in its rice marketing operations in 2008 and 2009.

More generally, extra spending to cope with the food price crisis and on stimulus programmes led to a general deterioration of government fiscal balances in most countries and an increase in public debt. While there are large differences among countries, and the Asian emerging economies are generally better placed to cope with new shocks than many other countries of the world, the seriousness of weaker fiscal balances should not be underestimated. The debt ratio in India now exceeds 60 percent of GDP – a figure comparable to the advanced economies experiencing serious debt-related problems – while Chinese government debt was revised up to 34 percent of GDP at the end of 2010, twice the level previously reported. Many other countries, such as the Philippines, Sri Lanka and Vietnam, are now more vulnerable to shocks because of their weaker fiscal situations. Efforts to rebuild fiscal resources will be constrained by the ongoing weaknesses of the global economy, and countries will face any new shocks with public finances weaker than in 2008. As the IMF (2011c) *Fiscal Monitor 2011 September* warns, "it is difficult to overstate the challenge confronting many advanced economies and some emerging economies, as the adjustment required to restore their debt ratios to more moderate levels is daunting" (p. 27).[97]

Given their weaker fiscal positions, Asian countries will face even greater challenges in the event of a serious international economic downturn and/or new shocks threatening food security. While it is clear that there should be concerted global action to reverse the long-term underinvestment in food and agriculture, discovering and implementing the optimal combination of public policy measures and market instruments for achieving price stability and food security pose major policy and research challenges. The search for more efficient tools to deal with food market volatility should be intensified and the scope for collective action and cooperative arrangements should be investigated with urgency. The current situation provides a window of opportunity to seriously address these security issues and this opportunity should be grasped by policymakers in the Asian region and around the world.

8. Conclusions and recommendations

Increasing food production

The food price spikes and global economic shocks of the past five years have demonstrated that the world cannot afford to be complacent about food production. It is also clear that each country should review the set of policy instruments available to cope with food security in a context of high and volatile international price setting in order to develop strategies to cope with unanticipated shocks, whether they are of internal or external origin.

The 2007/08 crisis was a wakeup call to a world that had grown complacent for two decades while living off the investments made in previous decades. Headey and Fan (2008, p. 388), pointed out that "…the recent price surge has clearly brought renewed attention to agricultural development issues. The challenge, however, will be to sustain these efforts once prices have fallen, once stocks have been rebuilt, and once the crisis atmosphere has abated". The global financial and economic crises and the economic recession tended to shift emphasis away from these longer-term food security issues. As our case studies showed, even when stimulus programmes paid attention to rural development and agriculture, often the focus was primarily on current price and income support. While this was understandable given the circumstances, arguably more could have been done to reconcile the short-term stimulus objectives with long-term productivity enhancing investments in food and agriculture,

[97] IMF (2011c).

including the threats to the agricultural resource base from climate change and other forms of environmental degradation.

As long as supply is unable to keep pace with demand, so that supply to utilization rates continue in the tendency to fall, the 'high price/high volatility' problems we have experienced in recent years will lead to even more acute food security crises.

The first policy message from our study is the imperative and urgent need to reverse the underinvestment in food and agriculture.

The continuing food price pressures are a signal of tight supply/demand conditions in global food markets; in tight markets where demand is very inelastic, relatively minor shocks can produce sharp spikes and high volatility.[98] Long-term imbalances and periodic sharp price spikes are inevitable unless production increases can keep pace with projected demand increases from both higher global population and higher incomes.

In the medium to long term, there will be continuing upward pressures on food prices due to tighter supply/demand conditions. As the FAO's *Looking Ahead in World Food and Agriculture: Perspectives to 2050 (FAO, 2011b)* points out, over the next four decades the world will need to increase food production by about 70 percent. Because of constraints on supply due to diminishing land resources, climate change and other factors, 80 percent of this increase will have to come from productivity increases.

This is a huge challenge to the Asian region, where half the world's population lives and where demand growth is fastest. The country case studies noted the many and formidable supply-side challenges to increasing food production, both economic and environmental, such as greater stress on the natural resource base, increased demand for water and land use for non-food purposes, etc. Productivity-enhancing public investments and policy measures that can facilitate greater private investment in food production, together with measures to maintain the productivity of the natural resource base, are vital to meet the projected food needs of the world.

However, as described in the FAO *State of Food and Agriculture in Asia and the Pacific Region* (FAO, 2010 draft: p.8), "The ratio of expenditure on agricultural research and development (R&D) to agricultural value added in the Asia Pacific region has gradually increased in some countries but declined or remained stagnant in others. Chinese expenditure on R&D fell from 0.57 percent of agricultural value added in the early 1960s to 0.4 percent in 2000. In Thailand the allocation remained stagnant at 0.4-0.5 percent since the 1970s, while in India it has increased from 0.18 percent to 0.34 percent. In all cases, these percentages are well below those found in developed countries such as the United States of America and Japan. In comparison to developed countries, where private sector investment in agricultural research and development is as high as 54 percent, the private sectors of the developing countries in the region account for only 8.1 percent of total investments in agricultural R&D.

In recent years the region has witnessed a decline in the overall allocation of overseas development assistance resources to the agriculture sector. The United States Agency for International Development (USAID) withdrew its support to regional R&D in 1996 in favour of global research. World Bank funding for agricultural R&D has been declining in consonance with the declining contribution of agriculture to overall GDP. Funds have been diverted increasingly to industry and services. The share of agriculture in total lending to the region fell from 11 percent in 1995 to 4 percent in 2000. It rose to 10 percent in 2006. Asian

[98] There is evidence suggesting that food demand has become even more inelastic in recent times as income growth reduces the share of food in household expenditure basket (see HLPE 2011).

Development Bank (ADB) lending to the sector also declined from 10 percent in 1995 to 7 percent in 2006."

It is imperative that this declining trend is reversed and agriculture is revitalized. There is strong evidence that public expenditure in agriculture has major impacts on overall productivity improvements, growth and poverty alleviation. The public sector has the role of creating a conducive and enabling environment for agriculture to exploit its potential, drawing in both domestic and foreign private investment. In a globalized world, this requires adopting a value chain approach to agriculture and food production, paying attention to all stages, from farmgate production through post-harvest storage and processing to marketing and delivery to consumers. This is a challenge that both governments and international agencies must embrace.

Recommendation 1:

We recommend that national governments and the international community formulate strategies to increase food production by re-ordering investment priorities to allocate public investment to agriculture, undertake policy reforms to eliminate policy distortions that distort incentives away from agriculture, and establish a policy and institutional environment conducive to attracting both domestic and foreign private investment into agriculture.

The second policy message is the need to have a set of policies in place that can reduce the volatility in food prices, while coping with shocks that will come from time to time.

The realistic challenge is to design policies and measures to reduce and manage volatility, rather than seek to eliminate it because volatility in food markets is nothing new and will never disappear: "Before considering interventions to reduce and manage price volatility, it must be recognized that some price volatility is an inherent characteristic of agricultural commodity markets" (FAO, 2011a, p. 32).[99] A range of policy instruments is available to both reduce volatility in food markets and cope with shocks as they occur, but none of them are costless and there are important trade-offs involved.[100] Each country needs to consider its individual circumstances and formulate the strategy that is most appropriate, drawing on the menu of options that is available.

As we have seen from the responses in the Asian region since 2007, policies that are effective in the short term may have significant longer-term negative effects because they have an impact on long-term producer incentives and/or on the stability of the international trading system. For example, export bans during times of high international prices can help to stabilize consumer prices, but they also reduce producer incentives to invest and expand output by lowering the average price producers can get over time.

Hence another policy message is the need to strengthen, not undermine, long-term incentives for food production and the international food trading system in pursuing national food security goals.

As it transpired, the primary aim of most countries was price stability and they were reasonably successful in achieving this. But this success came at a price. They reduced

[99] Indeed, as pointed out in the *Interagency Report (*FAO, 2011c*)*, current level of volatility is not exceptionally high by long-term historical standards. For a comprehensive discussion of these issues, see Prakash (2011). See also an excellent review of the issues and an insightful analysis of the policy responses to the 2007/08 crisis by Tangermann (2011).

[100] These are surveyed and discussed in detail in several recent publications, such as the FAO (2011a, 2011b).

producer incentives by cutting off profit opportunities for producers during times of high prices. The export restrictions, imposed in the context of increasing international prices, not only aggravated the international price surge but, even more importantly, threatened to cut off importer countries from accessing market supplies at the time of greatest need. They inflicted serious damage on the international food trade system and undermined confidence in the international food market as a source of reliable supplies. They made already shallow markets shallower and increased international price volatility. When countries cannot rely on international markets to supply import needs at reasonable prices, countries are forced to resort to maintaining overly-large buffer stocks, and to allocate resources to achieving levels of self-sufficiency that are economically inefficient.

While the greater emphasis on food production is welcome, self-sufficiency at any cost is not an optimal strategy: countries divert resources away from more efficient, growth-enhancing investments and industries to secure reliable domestic food supplies and, as seen in Indonesia, maintain high domestic prices in 'normal times' that reduce food security for the poor. Global food security requires that countries increase food production, but in an economically efficient and sustainable manner. This requires a combination of enhanced domestic food production together with effective utilization of the international trading system. The perceived unreliability of the international trading system is also a factor driving many countries to consider overseas investments in food production, leading to accusations of land grabs involving displacement of poor farmers.[101]

But it is unrealistic to expect that countries will respond very differently in the future, even in presence of credible, binding agreements that ensure stable supplies, unless they have alternative means to ensure that food-insecure households can be protected. The incentives for the 'marginal food exporter' economies to adopt trade-restrictive policies in crisis situations are very high. For governments in large countries which are marginal exporters, the immediate benefit from imposing export bans was – and is likely to remain – much larger than the perceived costs. The major reason why countries adopted trade policy restrictions was the fear that high prices would drive large sections of vulnerable households into severe food insecurity which can lead to political instability.

Safety nets

In this context, well-designed safety nets can provide food security for vulnerable groups when required, without the undesirable effects of trade restrictions, price controls or across-the-also board consumer subsidies.

This is one of the lessons to be drawn from the experience of Indonesia, where import quotas and other trade restrictions enabled households to avoid the impact of the sharp but temporary price hike but also hurt many poor households who had to experience food insecurity 'permanently' in normal times. If there were safety nets in place to protect the poor households during the temporary price spike, the large number of poor households would have had better food security while the farmers would also have enjoyed the benefits of the higher prices. As Msangi and Rosegrant (2011, p. 88) have pointed out: "Regarding social protection of the most vulnerable sections of the population, much can be accomplished through policy-driven strengthening of national social safety net programmes that provide relied for those who are most threatened by escalating food prices, while avoiding blanket policies such as price controls, which are easier (and cheaper) for governments to enact but which have the perverse effect of reducing producer responses that could soften the price rises through increased inputs. In this case, the main challenge facing policy is to keep a balance between maintaining producer incentives and avoiding distortions that could dampen the

[101] For a review of this issue, see Arezki, Deininger and Zelod (2011).

necessary self-correcting responses, while supporting human welfare through protecting the most vulnerable. The directing of interventions to those most in need requires deliberate and careful policy design, and this is often lacking in indiscriminate food subsidy schemes., which although they might benefit a lot of the poor (especially when they are the main consumers of the targeted staples), may also benefit better–off households that have other degrees of adjustment (or assets) to exploit."

These considerations lead us to conclude that efficient, well-designed safety nets should be an integral part of a balanced strategy to cope with food insecurity arising from high and volatile prices.

Recommendation 2:

We recommend that all countries take steps to set up efficient, targeted safety net schemes to meet the needs of vulnerable groups, particularly when faced with sudden and unexpected shocks to food prices. Where safety net schemes already exist, we urge countries to review their operations, scope and effectiveness and undertake measures to ensure that their coverage and funding is adequate to meet food security needs during crises and shocks.

Emergency reserves, buffer stocks and regional cooperation

There is a resurgence of interest in policies and measures required to achieve greater price stability and assured supplies, including the role of both domestic and international buffer stocks and price stabilization schemes.

In Asia, there is particular interest in exploring the scope for regional food security schemes, particularly in the case of rice, as most rice is produced and consumed in the Asian region. There are already regional initiatives along these lines, such as the South Asian Association for Regional Cooperation (SAARC) Food Bank and the Association of Southeast Asian Nations (ASEAN) Plus Three Emergency Rice Reserve that aim to establish regional holdings of buffer stocks. Though the reserve is meant to be used during food emergencies and not for price stabilization as such, release of stocks during an emergency can help stabilize prices in the recipient country. The historical experience with international price stabilization schemes and insights derived from economic theory has already generated a large body of literature which draws on and extends the large amount of previous literature on on the general topic of commodity price stabilization.[102] The thrust of much of this literature is to cast doubt on the efficacy of such schemes to successfully achieve price stabilization.

In the FAO (2011) publication, *Safeguarding Food Security in Volatile Global Markets*, C.L. Gilbert has reviewed in some detail the theoretical underpinnings and empirical evidence of international commodity agreements. He concludes on a pessimistic note about the role of national public stock schemes as well as international agreements (Gilbert, 2011, pp. 227-228):

"Many commentators have reverted to public sector storage as a possible response to apparently inadequate private storage. Public storage crowds out private storage so the mere introduction of a public storage programme increases the problem that it was designed to solve. Public storage is therefore costly, and possibly very costly. Finally, it is unlikely to be very effective in countering price spikes since the storage authority can only sell what it has previously bought. The knowledge that it cannot counter price spikes will leave it vulnerable

[102] See Galtier (2009), Gilbert (2011), Gilbert and Morgan (2010), several chapters in Prakash (2011), Tagermann (2011), Timmer (2010), von Braun, Lin and Torero (2009) and Wright (2009).

to speculative attack. The history of buffer stock storage in the international commodity movements bears out these views. If storage is seen as inadequate at the global level, it may be preferable to concentrate on measures which enhance rather than discourage private storage."

However, most national governments maintain and utilize buffer stocks to stabilize prices and to provide supplies to food-vulnerable groups during periods of supply shortfalls and sharp price increases, and it is also most unlikely that they will agree to dispense with any public storage system at all. Some analysts argue that public storage systems, in combination with other instruments, can be effective in achieving price stability for extended periods. Gilbert himself concedes that extrapolating from the experiences of the operations of the international commodity price agreements and buffer stocks may not be strictly valid, as those schemes were designed to achieve high and stable prices, not low and stable prices.

Clearly, governments believe in and are willing to incur the costs of public storage to retain some control over domestic prices. The potential for effective and cost-efficient operation of public storage must be explored to strengthen the role of world food markets as a source of stable food supply rather than a source of instability. Holding large reserves of grain stocks is costly and public storage creates some deterrents to private storage because of the government's capacity to manipulate the market price. Hence determining what is an adequate level of stocks, how and where stocks should be held and management of stocks is not an easy task. How national reserve management can be most efficiently combined with regional initiatives also requires further research.[103]

In this context, we note that our study has indicated substantial de facto market integration in the region, such as that between India and its smaller neighbours, Nepal and Bangladesh, and between Cambodia and its larger neighbours. It is worth exploring whether formalizing such integration might help to broaden and deepen food markets at the regional or sub-regional level, and provide greater stability against both internal and external shocks.
More broadly, there may be room for regional initiatives, perhaps within the existing framework of regional economic associations such as ASEAN and the SAARC Preferential Trading Agreement (SAPTA), to combine cooperative international action with appropriate national measures to manage volatility. In this context, it would be also be useful to revisit the related issue of the roles and potentials of both domestic and international futures markets in food commodities, including the potential for establishing a regional rice futures market as an instrument for enhancing food security and price stability which can complement publicly-managed buffer stocks and other forms of reserve holdings.[104] There are also important issues about the nature of appropriate regulatory regimes for such markets and the ways price information can be efficiently disseminated to small farmers.

Recommendation 3:

We recommend that regional and sub-regional initiatives be pursued to explore the potential for effective stabilization measures through combinations of publicly-managed buffer stocks and market mechanisms such as futures markets.

[103] See Basu (2010) for a review of the Indian experience with reserve management which has set out some of the economic principles that can help to improve the stabilization role of grain reserves through better management of procurement and stock releases.
[104] There is recent farm-level evidence that futures prices can improve price forecasts and provide benefits for small farmers (Cole and Hunt, 2010). In principle, there can be gains from a more efficient price discovery for all farmers, including small farmers not directly participating in futures trade, but there are also risks that market manipulation may produce greater price instability and damage market integrity. See Government of India (2010), *Economic Survey 2009/10.*

A reliable international food trading system

In principle, deeper, stronger international markets would facilitate better long-term food security goals but countries will commit to a trading system only if governments are convinced that cooperative arrangements can be superior to purely unilateral action. A new rules-based trading system would not only need to reconcile short-term incentives of national governments with longer-term stability of the international trading system but also to recognize the special and unique requirements of smaller, low-income counties such as Nepal. But it is not easy to design a system that can address all the possible issues or ensure that problems will not recur.

While safety nets and buffer stocks are likely to be important components of an integrated strategy to achieve food security, a central challenge for research is to devise effective policies that can optimally combine domestic production and the international market to deliver stable prices and ensure food security.

In view of both past experience of failures to establish a sustainable system of free trade in food and the strong incentives that exist for nations to abandon free trade in times of crisis, the research team felt that there would be merit in exploring 'second best' agreements. One example is a system of variable trade taxes based on a pre-announced schedule that depends on the international price level within the WTO framework. Such a system can stabilize domestic prices while avoiding highly destabilizing sudden export bans.

Recommendation 4:

We recommend that more research be undertaken on how national goals of food security and internal price stability can be achieved in the presence of high volatility in international prices while maintaining and strengthening the integrity of the international trading system. In this context, research should be undertaken to explore the costs and benefits of 'second-best' options such as variable trade taxes to reduce domestic price volatility when faced with international shocks, while recognizing that there are legitimate concerns about any form of export taxes on agricultural trade that may be used to tax agricultural producers and aggravate existing policy distortions against agriculture.

Asia and the world face new challenges to food security in the period ahead. The emergence of high and volatile food prices, the instability of the global economy, and the increasing pressures on food demand and supply as a result of growing population and degradation of the natural resource base all pose huge public policy challenges. Policies must be formulated and implemented so as to provide a conducive environment for farmers to increase productivity and output in the food sector, while maintaining food security for consumers, including the most vulnerable households. We hope that this analysis of the Asian experiences during the last five years of food price and economic crises, and the policy messages and recommendations based on this analysis, will encourage both public and private sector action to enhance global food production, reduce market volatility and enhance food security in Asia.

9. References

ActionAid/Oxfam . 2009. *The impacts of the global economic crisis on migration patterns in Vietnam: Findings from rapid assessments in five provinces and cities*. Hanoi (mimeo)

Alexandratos, N. 2008. Food price surges: possible causes, past experience, and longer term relevance. *Population and Development Review*, 34(4): 663-697.

Anderson, K. & Valenzuela, E. 2008. *Global estimates of distortions to agricultural incentives, 1955 to 2007*. Data spreadsheets at www.worldbank.org/agdistortions

Anderson, K. & Nelgen, S. 2010. How do governments respond to food price spikes? Lessons from the past. *Journal of International Commerce, Economics and Policy*, 1(02): 265-285.

Anderson, K. & Martin, W. (eds.) 2009. *Distortions to agricultural incentives in Asia.* World Bank, Washington, DC

Aksoy, A. & Isik-Dikmelik, A. 2008. *Are low food prices pro-poor? Net food buyers and sellers in low-income countries*. World Bank Policy Research Working Paper Series 4642, World Bank, Washington, DC

Asian Development Bank. 2008. *Food prices and inflation in developing Asia: Is poverty reduction coming to an end?* Special Report, Economics and Research Department, ADB, Manila

Asian Development Bank. 2009. *The global economic crisis: Challenges for developing Asia and ADB's response*. ADB, Manila

Asian Development Bank. 2010a. *Asian development outlook 2010*. ADB, Manila

Asian Development Bank. 2010b. *Asian economic monitor 2010*. ADB, Manila

Asian Development Bank. 2010c. *Key indicators for Asia and the Pacific 2010*. ADB, Manila

Asian Development Bank. 2011. *Global food price inflation and developing Asia*. ADB, Manila

Arezki, S., Deininger, K. & Zelod, H. 2011. *What drives the global land rush.* CESIFO Working Paper No. 3666

Baffes, J. & Haniotis, T. 2010. *Placing the 2006/08 commodity price boom into perspective.* World Bank Policy Research Working Paper Series 5371. World Bank, Washington, DC

Balisacan, A., Piza, S., Mapa, D., Abad Santos, C. & Odra, D. 2010. The Philippine economy and poverty during the global economic crisis. *The Philippine Review of Economics,* XLVII: 1-37.

Basu, K. 2010. *Economics of food grain management in India*. Ministry of Finance, Government of India

Carrasco, B. & Mukhopadhyay, H. 2012. *Food price escalation in South Asia - A serious and growing concern*. South Asia Working Paper Series No. 10. ADB, Manila

Carrasco, B., Hayashi, T & Mukhopadhyay. H. 2010. *The impact of the global crisis on South Asia*. South Asia Working Paper Series No. 1. ADB, Manila

Chen, S. & Ravallion, M. 2008. *The developing world is poorer than we thought, but no less successful in the fight against poverty*. Policy Research Working Paper 4703. World Bank.

Central Institute for Economic Management. 2009. *Vietnam's economy in 2008*. CIEM, Hanoi

Cole, S. & Hunt, S. 2010. *Information, expectations, and agricultural investment: Evidence from a field experiment in India.* http://mitsloan.mit.edu/neudc/papers/paper_311.pdf

Coxhead, I. & Huang Linh, V. 2010. *Country study on Vietnam*. Paper prepared for the FAORAP project on the impact of food price and global economic crises on food security in Asia. (mimeo)

Dawe, D. 2008. *Have recent increases in international cereal prices been transmitted to domestic economies? The experience in seven large Asian countries*. ESA Working Paper No. 08-03. FAO, Rome

Dawe, D. 2010. *The rice crisis: Markets, policies and food security*. FAO/Earthscan Publishers

Deb, U. 2010. *Country study on Bangladesh.* Paper prepared for the FAORAP project on the impact of food price and global economic crises on food security in Asia. (mimeo)

Department of Foreign Affairs and Trade, Government of Australia. 2010. High food prices, food security and the international trading system. http://www.dfat.gov.au/trade/focus/081017_food_security.html

Edillon, R. 2012. Country study on the Philippines. Paper prepared for the FAORAP project on the impact of food price and global economic crises on food security in Asia. (mimeo)

Food and Agriculture Organization. 2008. Soaring food prices: Facts, perspectives, impacts and actions required. High level conference on world food security: The challenges of climate change and bioenergy. 3-5 June 2008, Rome

Food and Agriculture Organization. 2009. The state of food insecurity in the world: Economic crises - impacts and lessons learned. FAO, Rome

Food and Agriculture Organization. 2010a. State of food and agriculture in Asia and the Pacific region. FAO, Rome (draft)

Food and Agriculture Organization. 2010b. Global food price monitor. 5 November 2010. FAO, Rome: http://www.fao.org/giews/english/gfpm/GFPM_11_2010.pdf

Food and Agriculture Organization. 2011a. The state of food insecurity in the world: How does price volatility affect domestic economies and food security? FAO, Rome http://www.fao.org/publications/sofi/en/

Food and Agriculture Organization. 2011b. Looking ahead in world food and agriculture: Perspectives to 2050: http://www.fao.org/docrep/014/i2280e/i2280e00.htm

Food and Agriculture Organization. 2011c. Interagency report to the G20 on food price volatility. FAO, Rome http://www.fao.org/fileadmin/templates/est/Volatility/Interagency_Report_to_the_G20_on_Food_Price_Volatility.pdf

Food and Agriculture Organization. 2011d. State of food and agriculture 2010-2011. FAO, Rome (draft)

Gilbert, C.L. 2010. Speculative influences on commodity futures prices 2006-2008. UNCTAD Discussion Paper No. 197, UNCTAD, Geneva

Gilbert, C.L. & Morgan, C.W. 2010. Food price volatility. Phil. Trans. R. Soc. B 2010, 365: 3023-3034. http://rstb.royalsocietypublishing.org/content/365/1554/3023.full.pdf+html

Gilbert, C.L. 2011. International commodity markets and their current relevance for grains price stabilisation. In Prakash, A. (ed.) Safeguarding food security in volatile global markets. FAO

Government of India. 2010. Economic survey 2009-2010, http://indiabudget.nic.in/es2009-10/esmain.htm

Hasan, R., Magsombol, M.R. & Salcedo Cain, J. 2009. Poverty impact of the economic slowdown in developing Asia: Some scenarios. ADB Economics Working Paper Series No. 153. ADB, Manila

Headey, D. & Fan, S. 2008. Anatomy of a crisis: The causes and consequences of surging food prices. Agricultural Economics, 39(s1): 375-391.

Headey, D. 2011a. Rethinking the global food crisis: The role of trade shocks. Food Policy, 36: 136–146

Headey, D. 2011b. Was the global food crisis really a crisis? Simulations versus self-reporting. IFPRI Discussion Paper 01087. IFPRI, Washington, DC

HLPE. 2011. Price volatility and food security. A report by the High Level Panel of Experts on food security and nutrition of the committee on world food security. Rome

Huang, J. & Rozelle, S. 2010. Country study on China. Paper prepared for the FAORAP project on the impact of food price and global economic crises on food security in Asia. (mimeo)

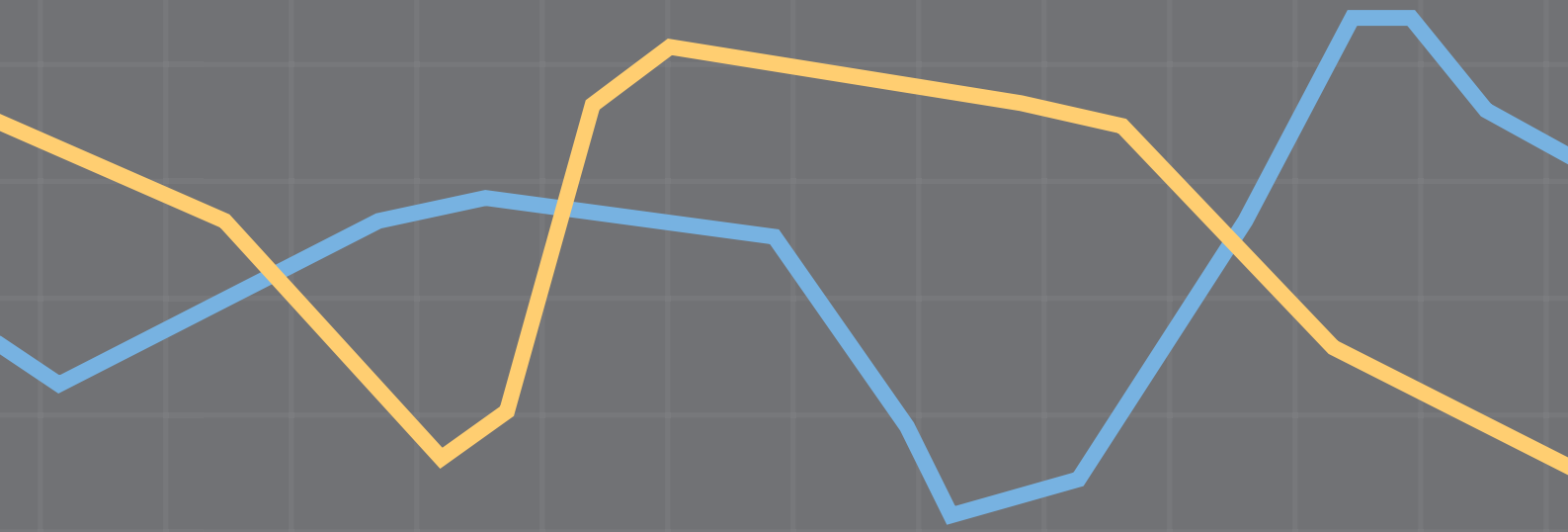
International Monetary Fund. 2008. Food and fuel prices – Recent developments,
macroeconomic impact, and policy responses. IMF, Washington, DC

International Monetary Fund. 2009a. World economic outlook. IMF, Washington, DC

International Monetary Fund. 2009b. Philippines: Selected issues. Country Report No. 09/63. IMF, Washington, DC

International Monetary Fund. 2009c. *Thailand.* Country Report No. 09/261. IMF, Washington, DC
International Monetary Fund. 2010a. *World economic outlook*. IMF, Washington, DC
International Monetary Fund. 2010b. *Regional economic outlook: Asia and Pacific*. IMF, Washington, DC
International Monetary Fund. 2010c. *Vietnam.* Country Report No. 10/281. IMF, Washington, DC
International Monetary Fund. 2011a. *World economic outlook September 11*. IMF, Washington, DC
International Monetary Fund. 2011b. *World economic outlook update*. IMF, Washington, DC
International Monetary Fund. 2011c. *Fiscal monitor 2011 September*. IMF, Washington, DC
Ivanic, M. & Martin, W. 2008. Implications of higher global food prices for poverty in low-income countries. *Agricultural Economics*, 39(s1): 405-416.
Jalilian, H., Reyes, G. & Pide, L. 2010. *Country study on Cambodia*. Paper prepared for the FAORAP project on the impact of food price and global economic crises on food security in Asia. (mimeo)
Kaufman, F. 2010. The food bubble: How Wall Street starved millions and got away with it. *Harper's Magazine*, July 2010: 27-34
Kaur, S. 2010. *Country study on India*. Paper prepared for the FAORAP project on the impact of food price and global economic crises on food security in Asia. (mimeo)
Korale-Gedara, P.M., Ratnasiri, S. & Bandara, J. 2012. Soaring food prices and food security: Does the income effect matter? *Applied Economics Letters*, 19(18): 1807-1811.
Little, I.M.D., Cooper, R.N., Corden, W.M. & Rajapatirana, S. 1993. *Boom, crisis, and adjustment: The macroeconomic experience of developing countries*, Oxford University Press, New York/ The World Bank, Washington DC
Lin, J.Y. & Martin, W. 2010. The financial crisis and its impacts on global agriculture. *Agricultural Economics*, 41(s1): 133–144.
Masters, W.A. & Shively, G.E. 2008. Introduction to the special issue on the world food crisis. *Agricultural Economics*, 39(s1): 373-374.
Msangi, S. & Rosegrant, M. 2011. World agriculture in a dynamically changing environment: IFPRI's long-term outlook for food and agriculture. *In* FAO (2011b), *Looking ahead in world food and agriculture: Perspectives to 2050*
National Economic and Development Authority. 2009. *The Philippine economic resiliency plan: Meeting the global crisis head-on*. NEDA, Manila
Nidhiprabha, B. 2010. *Country study on Thailand.* Paper prepared for the FAORAP project on the impact of food price and global economic crises on food security in Asia. (mimeo)
Padilla, A. 2009 A critique of the economic resiliency plan: Why Arroyo's P330-billion 'stimulus' package will not solve joblessness. *Bulatlat*, 9 May 2009
Patunru, A. & von Luebke, C. 2010. Survey of recent developments. *Bulletin of Indonesian Economic Studies*, 46(1): 7-31
Pohit, S. & Taneja, N. 2003. India's informal trade with Bangladesh: A qualitative assessment. *World Economy*, 26: 1187-1214
Polaski, S., Ganesh-Kumar, A., McDonald, S., Panda, M. & Robinson, S. 2008. *India's trade policy choices: Managing diverse challenges.* Carnegie Endowment for International Peace, Washington, DC, available at www.carnegieendowment.org/trade
Prakash, A. (ed.) 2011. *Safeguarding food security in volatile global markets*. FAO
Resosudarmo, B. & Yusuf, A.A. 2010. Survey of recent developments. *Bulletin of Indonesian Economic Studies*, 45(3): 287- 315
Rose, F.S. 2010. *Investment in United States futures and options markets: A discussion of the possible impact on commodity prices*. FAO food outlook: Global market analysis, June 2010: http://www.fao.org/docrep/011/ai482e/ai482e12.htm
Shapouri, S., Rosen, S., Meade, B. & Gale, F. 2009. *Food security assessment, 2008-2009.* USDA Economic Research Service.
http://www.ers.usda.gov/Publications/GFA20/GFA20.pdf

Taneja, N. & Pohit, S. 2002. Characteristics of India's informal and formal trading with Nepal: A comparative analysis. *Indian Economic Review*, 37(1): 69-89
Tangermann, S. 2011. Policy solutions to agricultural market volatility: A synthesis. ICSTD Issues Paper 33. ICTSD, Geneva
Thapa, Y.B. & Khanal, D.R. 2010. *Country study on Nepal*. Paper prepared for the FAORAP project on the impact of food price and global economic crises on food security in Asia. (mimeo)
Timmer, C.P. 2008. *Causes of high food prices*. ADB Economics Working Paper Series, No. 128. ADB, Manila
Timmer, C.P. 2010, Management of rice reserve stocks in Asia: Analytical issues and country experience. *Commodity Market Review, 2009-10*: 87–120. FAO, Rome
Timmer, C.P. 2010. Behavioral dimensions of food security. *Proceedings of the National Academy of Sciences*. www.pnas.org/content/early/2010/09/15/0913213107.full.pdf
Timmer, C.P. 1996. Does BULOG stabilise rice prices in Indonesia? Should it try? *Bulletin of Indonesian Economic Studies*, 32: 45-74
Timmer, C.P. 2002. Agriculture and economic growth. *In* B. Gardner & G. Rausser (eds.), *Handbook of agricultural economics, Vol. 11a*, pp. 1487-1546. North Holland, Amsterdam
Tong K., Khieng, S., Phann, D., Hem M. & Pon, D. 2009. *Vulnerable workers survey in Phnom Penh, Kandal, Kompong Speu, Siem Reap and Battambang*, CDRI, Phnom Penh
United Nations Economic and Social Commission for Asia and the Pacific. 2010. *Economic and social survey of Asia and the Pacific 2010.* UNESCAP, Bangkok
Viatte, Gérard, Jacques De Graaf, Mulat Demeke,Takashi Takahatake and María Rey de Arce 2009. *Responding to the food crisis: Synthesis of medium term measures proposed in inter-agency assessments* FAO, Rome
von Braun, J., Lin, J. & Torero, M. 2009. *Eliminating drastic food price spikes – a three-pronged approach.* International Food Policy Research Institute, Washington, DC
Warr, P. 2008. World food prices and poverty incidence in a food exporting country: A multihousehold general equilibrium analysis for Thailand. *Agricultural Economics*, 39(s1): 525-537
Warr, P. & Yusuf, A.A. 2010. *Country study on Indonesia*. Paper prepared for the FAORAP project on the impact of food price and global economic crises on food security in Asia. (mimeo)
Weerahewa, J. & Kodithuwakku, S.S. 2010. Country study on Sri Lanka. Paper prepared for the FAORAP project on the impact of food price and global economic crises on food security in Asia. (mimeo)
World Bank. 2010a. *World development indicators 2010*. World Bank, Washington, DC
World Bank. 2010b. *South Asia economic update 2010: Moving up, looking east.* World Bank, Washington, DC
World Bank. 2010c. *Thailand economic monitor 2010*. World Bank, Washington, DC
World Bank. 2010d. *Taking stock: An update on Vietnam's recent economic developments*. World Bank, Washington, DC
World Trade Organization, 2010. *International trade statistics 2008*. WTO, Geneva
Wright, B. 2009. *International grain reserves and other instruments to address volatility in grain markets*. Policy Research Working Paper Series 5028. World Bank, Washington, DC



The study aims to increase understanding of: (a) the impact on economies and households of the first food price spike of 2007/08 – which was widely described as a food crisis – as well as the global financial and economic crises (b) the nature, outcomes and effectiveness of particular policy responses; (c) the agricultural and food security challenges confronting each country; (d) the extent to which immediate and longer term food security issues were addressed in programmes undertaken to cope with the impact of the financial and economic crises; and (e) the lessons that have emerged for country policies, as well as for regional and global cooperation to meet food security challenges. The countries in the study have many shared characteristics as well as striking differences in such attributes as the size of population and economy, stage of development, trade dependency, status as a net food exporter or importer and availability of international reserves.

ISBN 978-92-5-107320-9

9 789251 073209

I3031E/1/09.12