The 2007–2008 food price swing

Impact and policies in Eastern and Southern Africa

2007 2008

Cover photograph: FAO,Mediabase.

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food price episode
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Abbreviations

ADMARC: Agricultural Development and Marketing Corporation of Malawi

DFID: UK Department for International Development

FAO: Food and Agriculture Organization of the United Nations

FDI: Foreign Direct Investment

FRA: Food Reserve Agency of Zambia

GDP: Gross Domestic Product

IMF: International Monetary Fund

NCPB: National Cereals and Produce Board of Kenya

OECD: Organization for Economic Cooperation and Development

SAFEX: South African Futures Exchange

WTO: World Trade Organization

VAT: Value Added Tax

UNCTAD: United Nations Conference on Trade and Development

Acknowledgements

DFID

Chapter 1
Introduction

Between 2007 and 2008, the world experienced a dramatic swing in commodity prices. Agricultural commodity prices also increased substantially with the FAO food price index rising by 63 percent between January 2007 and June 2008, as compared with an annual rate increase of 9 percent in 2006. During the same period the international prices of traditional staple foods such as maize and rice increased by 74 and 166 percent respectively, reaching their highest level in nearly thirty years. After its peak in June 2008, the food price upswing decelerated and in the autumn, international food prices decreased sharply as expectations for an economic recession set in. Between June 2008 and January 2009, with the demand for commodities weakening due to the global economic slowdown and improved food crop supply, the FAO food index decreased by 33 percent.

Eastern and Southern African countries experienced considerable difficulties due to the price food swing. The price boom resulted in high food import bills, inflation and significant problems for the whole economy as many countries gave up more exports for the imports they received. Increased food import costs tightened foreign exchange constraints. This directly affected food security and the economy through the accumulation of external debt and the reduction of merchandise and services imports that are vital for development. Given the growing dependence of many developing countries on imported food commodities and on foreign aid, increasing food prices have important policy implications. Poverty also increased as households struggled to meet the high cost of food.

Despite the drop in food prices, the world economic recession has carried a different set of problems. The decline in exports due to weak demand, decreased foreign investment and migrant remittances, as well as high unemployment all result in additional problems for already vulnerable developing countries.

Policy reactions to the food price surge have been prompt in many developing countries. A number of short-run measures, such as reductions in import tariffs, in order to rein in the increase in food prices and to protect consumers and vulnerable population groups, were introduced. Other countries resorted to food inventory management in order to stabilize domestic prices. A range of interventions have also been implemented to mitigate the adverse impacts on vulnerable households, such as targeted subsidized food sales. Other countries scaled-up already existing input subsidy programs to assist producers and stimulate supply response as fertilizer prices also soared.

The key objective of this paper is to discuss feasible policy approaches for the economic management of food price booms and slumps. As a first step to policy assessment, the paper also focuses on the examination of the nature of the food price episode, the analysis of its impact on both household and wider economy levels and the examination of the policies that have been, or are currently implemented in Eastern and Southern Africa.

Food price swings require good economic management skills. Appropriate policy responses are likely to be conditional on the length of the price episode and the structure of the national economy. In most cases, the relevant policy question relates to how much to adjust to new market conditions. That is:

• how much to finance, in the event of an adverse shock to the economy; and,
• how much to save, in the event of a positive impact.

A mixture of policies at the micro- and macro-economic levels can help food producers and consumers to adjust to price upswings and downswings. Social safety nets, non-distorting market-smart input subsidies, prudent trade policy and direct market intervention, efficiency enhancing policies and good budget management can effectively offset part of

the negative impact of food price episodes. Both upswings and downswings in food prices require government expenditures.

A number of countries in Eastern and Southern African regions attempted to alleviate the pressure on consumers through the reduction in import tariffs, direct market interventions and general consumption subsidies. These measures proved ineffective in reining in the food price surge in the domestic markets. Given the extent to which international prices soared, import tariff reductions offset only a small part of the increase. Direct intervention through government import programs and open market operations were also unsuccessful and very costly.

Targeted consumer subsidy or public work programs address the need of the population in the lower ranges of the income distribution. In a number of countries where such safety nets were in place, the short run response to the food price surge was to scale operations up by increasing the spending per person or relaxing the eligibility criteria to expand the targeted population. However, scaling-up food safety nets is not easy. In addition to their high budgetary requirements, the programs should have the administrative capacity to expand, while if expansion takes place through the relaxation of the eligibility criteria, additional targeting mechanisms may have to be employed. In some way, the recent price episode highlighted that vulnerability remains a major challenge, even if safety nets are in place.

Market-smart input subsidies can enhance the ability of smallholders to respond to the increase in food prices and contribute towards national and household food security. Such schemes can lead to increases in production which, in turn, result in price upswings in the domestic market becoming shorter in terms of time and less pronounced in terms of magnitude, thus benefiting the consumers. Nevertheless, market-smart input subsidies involve high costs, while the management of such programs is difficult, especially during periods characterized by volatile food and output prices.

Although only resource-abundant countries, particularly exporters of oil and metals, may experience a positive shock during a commodity price boom, food producers can also benefit. Good economic management of the price windfall at the national level can result in investments that trigger growth and development. Countries that successfully managed agricultural booms and slumps in the past have provided information to producers on the nature and length of the price swing, as well as the necessary conditions to farmers to save the windfall. As saving and borrowing offers a means for making choices on how much to consume and how much to produce at different points of time, the development of a competitive rural finance sector can assist rural households to smooth consumption effectively during price booms and slumps.

Similarly, as the economic recession leads to unemployment and poverty, it requires countercyclical policies in order to stimulate the economy, sustain exports and protect the vulnerable population groups. As the financial sector is experiencing significant problems globally, policies should also support the provision of trade finance to small and medium size firms.

The recapitalization of banks and generous investment packages are the standard policy reaction of developed countries to the financial and economic crisis. Low income developing countries have a limited scope for such solutions, however expenditure policies are necessary to effectively target population groups that are vulnerable to the decline in trade and the rise in unemployment. Again, safety nets and public works programs consist of policy options that aim to increase the purchasing power of the poor and the unemployed. Trade

policy also plays an important role. An escalation in protectionism is a common reaction to economic recessions. Nevertheless, concerted increases in trade barriers would further exacerbate the negative impact of weak demand on trade. Measures for supporting trade finance are also crucial given the global tight credit conditions. As the private banks, which supply the bulk of trade credit globally, falter, governments should devise ways to share the risk and provide short-term solutions.

Both the analysis and policy assessment in this paper is based on a number of meetings that took place within the activities of the project *"Policies for Good Economic Management of Food Price Swings"* which is funded by the UK Department for International Development (DFID) and implemented by the FAO Trade and Markets Division. In the midst of the price boom and in order to assess policy options and solutions, a meeting was called in FAO to discuss the causes of high food prices, their impact on both the wider economy and the household level and the management of the food price variability[1]. This workshop brought together policy experts from academic institutions and various international agencies. A number of additional informal expert consultations were held in Kenya, Uganda, Malawi and Zambia to examine the experiences of commodity dependent and food importing countries in the region and to formulate policy options for the economic management of price swings. These meetings also built on FAO's ongoing activities in several inter-related ways: by discussing the various reasons behind the price uptake and by debating the underlying rationale for appropriate policies for the management of the price hike at both the household and the wider economy levels.

This study presents a synthesis of research and policy assessment which was carried out in the FAO Trade and Markets Division, as well as in the discussions that took place during the above mentioned meetings. It also looks at the recent market developments, examines the reasons behind the food price boom and slump and proposes policies for the management of both price upswings and economic slowdowns. The first section focuses on the causes of the 2007–08 food price episode and the characteristics of the shock in terms of duration and volatility. The contribution of biofuels, macroeconomic factors and the futures markets to the food price behaviour is examined in detail. The transmission of international price changes to the Eastern and Southern African domestic markets is discussed in Section 3. The impact of increased food costs on the well-being of households in developing countries is discussed in Section 4. This section presents the impact of the price surge on household consumption patterns in Malawi, Zambia and Uganda, as well as the effect of the increased cost of food on food security. Household coping strategies are also discussed.

Trade policies and fiscal measures, such as tax reductions, are discussed in Section 5. This section also examines the effectiveness of open market operations in a number of countries in the region and provides some policy recommendations. Section 6 considers different policy options to offset the impact of price increases on vulnerable population groups, as well as policies that aim to stimulate supply responses. This section also examines those safety net policies that can be implemented effectively in a counter-cyclical manner, scaling-up the benefits during the price upswing and scaling-down when prices fall. Section 7 looks at policies that can assist producers in adjusting to price booms and slumps through an easier access to banking services. It discusses the need for an efficient rural financial services sector and addresses the question developing countries' governments face on how the windfall can be translated into consumption smoothing, increased investment and improvements in the rural livelihoods and food security. Finally, the impact of the price swing on the

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[1] This workshop was organized in Rome at FAO Headquarters on 10–11 July 2008 by the FAO Trade and Markets Division.

macroeconomy is examined in Section 8. Food price shocks and economic slowdowns pose challenges that either necessitate macroeconomic policies or have macroeconomic consequences. The section discusses the impact of food price surges on the wider economy and examines both government expenditure options, as well as proposals for the use of monetary policy as an instrument for agricultural development. It also examines the effect of the financial crisis and economic recession on African countries and discusses the policy options, including trade policy, safety nets, trade finance support programs and aid.

Chapter 2
The 2005–2008 food price swing

In the period since 2005, the international prices of food rose increasingly to a peak in mid-2008 only to fall back although to a level that is relatively high. The behaviour of food prices has been shaped by a number of factors. The fast world economic growth has been a major driver of the commodity boom in which food commodities have also taken part. Historically, food prices have followed a downward trend relative to the prices of manufactured goods. This trend has been interrupted by a number of episodes characterized by booms and slumps, such as that of 1973–1974.

The recent commodity price swing shares a number of similarities with the 1970s price episode. Both were characterized by fast economic growth, inflation, low real interest rates and excess international liquidity. In both cases there was a sharp tightening of food markets due to a run-down in the carrying-over stocks of cereals. Nevertheless, the two price episodes differ in that in1973–74 food prices led the commodity boom, while in 2007–08 energy and metals prices started rising well before the prices of food commodities. Supply side factors were more important in 1973–74, as food prices rose in response to poor harvests. Currently, supply factors also have played an important role. Decades of low investment levels have resulted in agriculture, especially in developing and less developed countries, having a limited capacity to respond. However the impact of supply factors in the 2007–08 episode is contextual and may not be as important as that of the 1970s swing. Although the upswing of food prices came to an end in late 2008, food prices continue to remain at levels higher than those in 2005.

The current price episode, however, differs from that of the 1970s in two aspects. First the energy and food markets today are integrated, because of the processing of food crops, such as sugar, grains and oilseeds, into ethanol and bio-diesel. Second, portfolio investment in futures markets was not such a widespread option in 1973–74, while the recent price swing was characterized by increased trading and investment in agricultural futures markets.

This section discusses the reasons behind the recent price surge and slump. It examines the impact of the world economic growth on food prices and explores the contribution of the oil price shock and the increase in the demand for biofuels to the food price upturn. The role of macroeconomic factors, and especially of monetary expansion and adjustments in the US, is also discussed in detail and within the context of the financial crisis which eventually put an end to commodity price increases. In addition, the section examines the role of speculation in futures markets and reviews the evidence on the likely emergence of a situation similar to a 'financial bubble'. The section also draws from recent literature on the links between the agricultural and financial markets, and discusses the effect of institutional investors, who have been active in agricultural futures markets, on food prices.

2.1   THE IMPACT OF WORLD ECONOMIC GROWTH ON ENERGY AND FOOD PRICES

Since 2005, the prices of energy and metals have exhibited an upward trend due to a strong demand in particular from fast-growing Asian markets, such as China and India. In emerging economies, energy has a high income elasticity of demand. Increases in household income result in purchases of automobiles and other consumer durables that use energy which strengthen the demand for oil and electricity. For example, empirical results show that the long-term income elasticity of imported crude oil in India is approximately 1.97 and that there exists a unidirectional long run causality running from economic growth to crude oil imports (Ghosh, 2008). The upward trend in the prices of metals was triggered

by intense manufacturing activity and the construction boom, both resulting, in particular, from the rapid growth of the leading Asian economies, as well as of other economies.

The increases in energy prices have been the most important feature of the world economy over the past few years. In a direct manner, oil price rises have contributed to the food price upswing. Nevertheless, this contribution is likely to be small. High oil prices directly affect all activities, including food production, as energy is an important input of agricultural production. In addition, high energy prices affect the cost of food through their impact on fertilizer prices. In many countries of the developing world, oil price increases have been completely passed-through to fertilizer prices which, especially in Africa rose nearly twofold, significantly increasing the costs of agricultural production. In fact, the increases in the price of fertilizer have exceeded the rise in food prices, affecting the profitability of agricultural production and the livelihoods of millions of smallholders in developing countries. In addition to this margin crunch, the relatively faster rate of increase exhibited by productive inputs' prices affected the ability of farmers to obtain credit to finance input purchases. This is likely to have hindered supply response and to have exacerbated the food availability problems faced by governments in developing countries.

Downstream in the food supply chain, the increase in energy prices affected freight rates. Transport cost rises widen the gap between producer and consumer prices, with consumers absorbing the entire increase in the marketing margin. In developing countries with poor transport infrastructure, such an increase in the cost of marketing and the retail price of food has been significant, negatively affecting consumers, without generating any additional gain for producers.

Thus, the strong world economic growth had a direct impact on food prices largely through the effect of the increasing prices of energy on production costs, while its effect on food demand was small.

2.2 THE ROLE OF BIOFUELS

The role of biofuels in the 2007–08 food price episode is probably one of the most controversial issues in any discussion on both the causes of the crisis and the appropriate policy responses. A number of studies have dealt with this topic, however the results are controversial. For example, a study by Mitchell (2008) suggests that the use of crops for the production of biofuels is the main driver behind the grain price upswing, contributing approximately 100 percentage points to the overall 140 percent rise in grain prices. Another study by the United States Department of Agriculture (Trostle, 2008) suggests that during the 1990 decade, ethanol production in the US had a small effect on the global maize market, while increases in the production of ethanol from 2002 to 2008 had a more pronounced impact on the international maize price. Schmidthumber (2006), Rapsomanikis and Hallam (2006), and Balcombe and Rapsomanikis (2008) focused closely on the relationship between the prices of oil, ethanol and sugar, shedding light on an additional dimension of the integration between food and energy markets. Their findings suggest that, on average, sugar, ethanol and oil prices are indeed related and tend to move together, however, this relationship is not continuous and is characterized by nonlinearities. In general, increases in the price of oil strengthen the demand for ethanol and result in increases in sugar prices. Nevertheless, in the short run the relationship between oil and sugar prices may not always hold. This depends on whether oil prices are above or below a threshold which is determined by ethanol production costs and other factors. For example, oil price increases over this threshold activate the relationship between sugar, ethanol and oil prices. When oil prices move below the threshold, sugar prices are determined by food market fundamentals only.

Depending on agro-climatic conditions, biofuel producing countries utilize different crops as inputs. Sugar cane is used in Brazil, while in the United States the main energy crop is maize. In Europe, bio-diesel is produced by oilseed rape, while Asian countries use palm oil. This wide range of crops used for the production of biofuels indicates the extent of the likely impact of biofuels' production on food markets. If sugar cane, which is utilized to produce ethanol with the most efficient processing technology in Brazil, were the only crop used for biofuels, the effect on food prices would likely be limited. But, wheat, maize, oilseeds, rice and sugar have all been part of the food price upswing. Wheat has no economically viable biofuel applications but its supply is determined by its prices in relation to the prices of other grains, such as maize. Grains are easily substitutable in production, and producers, especially in large developed countries, allocate areas to different grains on the basis of relative prices. So increases in the price of maize, brought about by strong derived demand by ethanol processors, take land out of wheat, resulting in higher wheat prices (see Figure 1).

Figure 1 – Prices of food commodities and crude oil (January 2005 - January 2009)
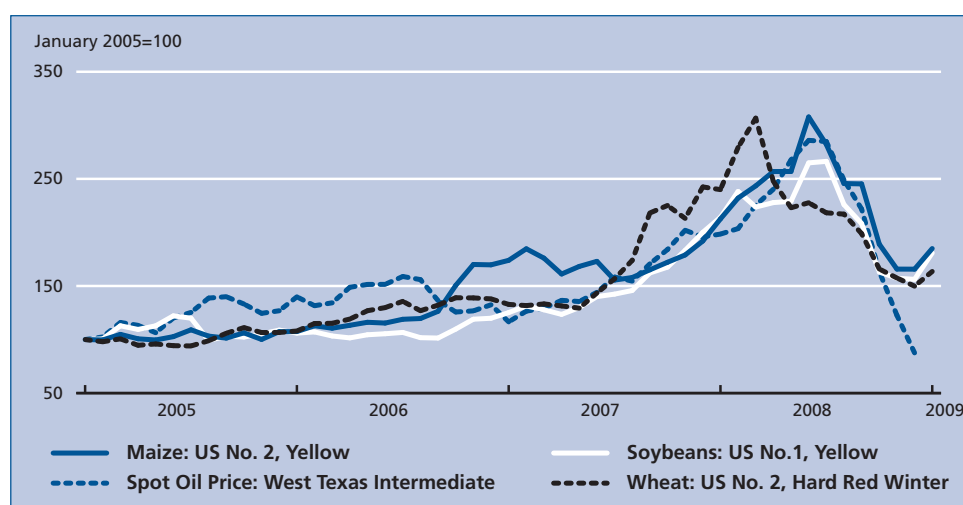
Source: International Financial Statistics, IMF.

Maize is not as significant as wheat in world trade. However its conversion to ethanol in the United States and the consequent impact on US maize exports affects the world market. Rice is not processed into biofuels, but, depending on consumer preferences, it is substituted in consumption by wheat and maize, resulting in a positive relation between the prices of rice and other grains.

Although difficult to quantify, the impact of biofuels on food markets is substantial and will probably persist, as the United States and European Union Member States have set mandated targets to limit their own greenhouse emissions by expanding the use of renewable fuels. With the exception of Brazil, where about half of sugarcane production is being used for the production of ethanol, the proportion of crops allocated to the production of biofuels has been, in the past, relatively small. Nevertheless, recently, substantial increases in the conversion of other crops to biofuels have been taken place in line with the growing share of biofuels in the global transport energy market. In the United States, the world's largest maize producer, about 25 percent of maize was allocated to the production of ethanol in 2007–08, assisted by a range of policies such as tax incentives and subsidies (Mitchell, 2008). In a similar line, the production of bio-diesel in the European Union is supported by high import tariffs and other policy instruments. Support of the

ethanol processing sector is a controversial issue and developed countries' governments that subsidize biofuels have been strongly criticized for raising the prices of food. In these countries, the production of biofuels is not commercially viable as costs are higher than the costs of fossil fuel. Government intervention is therefore essential in providing incentives to the industry, and subsidies are necessary to undertake biofuel production. In Brazil, although the government's intervention is now minimal, the sector was initially sustained by a number of policies in order to achieve a scale necessary to minimize production costs and ensure profitability.

The case of sugar provides useful insights on the factors that govern the behaviour of energy and food prices. Sugar prices experienced a strong upswing in 2005 and 2006, reaching historically high levels, mainly due to strong demand for sugarcane for conversion into ethanol. During this period, oil price increases enhanced ethanol's competitiveness, with ethanol production costs being lower than the price of petrol, thus fuelling the demand for sugarcane by distillers. As both ethanol and refined sugar utilize the same input - (sugarcane) increases in the quantity produced of ethanol (sugar) positively affected the price of sugar (ethanol). This relationship arises due to the short run fixity that characterizes the supply of sugarcane, the main input (Balcombe and Rapsomanikis, 2008). As the area under sugarcane cannot expand as rapidly as the demand for ethanol, at least in the short-run, strong derived demand for sugarcane causes increasing sugarcane prices, and consequently sugar prices. As long as high sugarcane prices do not cause ethanol's production costs to be higher than the price of petrol, sugarcane's value in the energy market exceeds that in the food market. As sugarcane is diverted to ethanol production, demand for sugarcane results in further increases in the price of sugar.

In addition to ethanol production costs, there are two other important factors that drive the oil-ethanol-sugar price relationship, namely the substitution in fuel consumption in the energy market and the supply response in the food market. The introduction of ⬚ex-fuel vehicles, which can use any combination of petrol-ethanol blends, including pure ethanol, has allowed petrol and ethanol to be readily substituted and purchased on the basis of relative prices. As such vehicles constitute a growing share of the Brazilian automotive ⬚eet, substitution possibilities between petrol and ethanol have increased, resulting in a stronger relation between the prices of ethanol and petrol.

The agricultural sector's capacity to respond rapidly to increased demand by the biofuel processing sector is also central in determining the relationship between food and energy prices. For example, in 2006–07 the Brazilian sugar sector responded rapidly, expanding the area under sugarcane and increasing production, thus alleviating the upward pressure on sugarcane and world sugar prices.

The relationship between energy and food prices can break down for a number of reasons. First, a significant reduction in the price of oil, as the sudden drop that took place in September 2008, may render ethanol uncompetitive at the pump, as well as in other applications. The subsequent contraction in the demand for biofuels causes the prices of crops to drift apart from those of oil, being determined only by food market fundamentals. For example, the recent financial crisis and the economic recession affected the demand for energy, causing the prices of oil to decrease dramatically to approximately US$40 per barrel. This contributed to a contraction in the derived demand for food crops by ethanol processors, thus alleviating the upward pressure on food prices.

Second, intensified competition for food crops among food and biofuel processors may result in high food prices and thus increased biofuel production costs. This weakens the competitiveness of biofuels relative to petrol. Indeed, during the 2006 oil price upsurge

in Brazil, there were instances when ethanol prices were at least equal to petrol prices. In this case, consumers switched back to petrol and sugar prices settled down to reflect food market conditions only, until biofuels became competitive again. Such changes in the forces that determine crop prices can be abrupt, resulting in increased food price variability.

Finally, the extent to which supply responds determines the availability of inputs for both the production of biofuels and food. Brazil managed to expand the area under sugarcane significantly, thus lessening the pressure on sugarcane and sugar prices for two consecutive crops (2006–07 and 2007–08). In June 2008, prices increased reacting to the market's anticipation of world sugar production falling short of expected consumption in the 2008–09, due to less favourable crop prospects in Brazil. By contrast, world cereal production hit a record level in 2008–09 due to increased plantings and favourable weather conditions. In developed countries, the supply of wheat and coarse grains can respond to market conditions as rapidly as the supply of sugarcane in Brazil. In most developing countries however, agriculture appears to have a limited capacity to respond to price increases, mainly due to under-investment during the past two decades. In the past, low agricultural prices have undoubtedly contributed to low levels of investment and productivity growth, resulting in a decrease in the 'buffer' capacity of the market to absorb shocks. Both the FAO High Level Conference on the Food Crisis (FAO, 2008) and the 2008 World Development Report of the World Bank (World Bank, 2007) have called for the prioritization of agriculture.

An understanding of the upswing of food prices and their relationship with the energy market can help in to inferring to a certain extent, the behaviour of food prices in the future. As the United States, the European Union, and also other developed and large developing countries have set mandated targets to expand the use of biofuels, it is to be expected that if oil prices are to increase above a certain level, food and energy markets will remain integrated. The link may strengthen in tandem with advances in technology. Improvements in processing technology could reduce biofuel production costs, increase the availability of flex-fuel vehicles in the transport markets of ethanol producing countries, and enhance fuel substitution possibilities. Support to the biofuels processing sector may also result in biofuels being competitive, even if oil prices fell back to a certain extent. Nevertheless, large decreases in the oil price, such as those experienced following the onset of the global economic recession, render the relationship between food and energy markets inactive, resulting in food prices being determined mainly by agricultural market fundamentals.

2.3 MONETARY AND FINANCIAL FACTORS: BOOMS AND SLUMPS

Many researchers have emphasized the importance of macroeconomic and financial factors in determining agricultural commodity prices. As early as the 1973–74 food price surge and the collapse of the Bretton Woods system, Schuh (1974) stressed the importance of monetary policy in affecting the exchange rate and in shaping agricultural development and trade, mainly through changes in the price of domestically produced food and in the sector's competitiveness in the world market. A number of researchers argued that in the short run, in addition to the exchange rate, money supply provides an additional avenue through which macroeconomic policy affects food prices (Bordo, 1980; Chambers, 1984; Frankel, 1986). In the long run, money is seen as being neutral, with prices and wages being affected in nominal terms, while no impact is observed on real variables such as real prices, consumption and output. For example, an one percent increase in money supply will result in an one percent increase in the price level in the long run, leaving economic variables expressed in real terms unaffected. However, in the short run monetary expansion

(contraction) results in an increase (decrease) in storable agricultural commodity prices in real terms.

This transmission of the monetary impact on storable commodity prices is determined by inventory behaviour. Inventory accumulation and depletion is shaped by an arbitrage condition that, in equilibrium, precludes a difference between the interest rate and the 'convenience yield' (the sum of expected rate of increase in commodity prices minus storage costs). For example, an increase in the supply of money causes interest rates to fall, thus increasing the incentive to hold inventories. As the demand for storable commodities is strengthened and quantities are withdrawn from the market and brought into storage, commodity prices increase.

Monetary expansion also triggers expectations for an increase in the inflation rate and causes investors to move away from liquid assets towards other investments including commodities, with the latter 'overshooting' their long-run equilibrium level and increasing proportionally more than the money supply and the general price level in the short run. This upward trend in commodity prices will be reined in as commodities will be considered 'overvalued' by the market as compared with other goods (Frankel, 1986). As the expected return of carrying inventories decreases, the impact of the low interest rates on storage is offset, thus causing commodity prices to fall and move in line with the general price level.

Commodity prices 'overshoot', or temporarily change, beyond their long-run equilibrium level, as this is determined by money and the interest rate, mainly due to their flexibility relative to the prices of manufactured goods and services (Bordo, 1980). Commodity prices – especially agricultural commodity prices – can adjust quickly to monetary changes. There are several reasons underlying this flexibility. For example, food and non-food commodities are relatively homogeneous and therefore subject to lower transaction costs than manufactured goods. Agricultural commodity markets have shorter-term contracts than other markets, and thus prices respond quickly to monetary changes. Therefore, in the short run an increase in money supply will affect commodity prices, but not the prices of manufacturing goods and services which adjust to changes in money at a slower rate.

Macroeconomic factors were important in determining the 1973–74 price spike. This took place after the breakdown of the Bretton Woods fixed exchange rate system, which caused a substantial increase in international liquidity, leading to high inflation and low real interest rates. This provided an incentive for inventory accumulation. The period from 1972 to 1973 was also characterized by rapid changes in the parities between major currencies, which followed the collapse of the Bretton Woods system, and by poor performance of stock exchanges (Radetski, 2006).

As the US dollar ceased to provide an anchor in terms of monetary value within an environment characterized by rapid inflation, investors saw a safer asset in non-food and food commodities. This resulted in sharp increases in their prices (Cooper and Lawrence, 1975). Although there were significant shortfalls in crop production and heavy rundown of carry-over stocks which preceded the food price upswing and contributed to the general price boom, the original trigger may be seen as the monetary expansion and an unreliable financial environment. Commodity prices fell sharply after 1974 as a result of the economic recession, as well as the recovery of production.

The 2007–08 price episode can also be attributed in part to macroeconomic factors. Economic growth and loose money supply in the United States played a dominant role in determining food and non-food commodity prices. Bordo (2008) stresses that booms and

> **Box 2.1: Money supply and food prices: Empirical evidence**
>
> On the whole, the empirical work supports the notion that in the short run, real commodity prices are determined partly by money supply and overshoot their long-run equilibrium. However, Bessler (1984), using Brazilian data, provided evidence that money supply affects agricultural prices, but found weak evidence that agricultural prices adjust faster than industrial prices. Devadoss and Meyers (1987) suggested that US agricultural prices respond faster to money supply changes, as compared with the prices of manufactures, while Orden and Fackler (1989) found that loose money in the United States raises agricultural commodity prices relative to the general price level for longer than one year. Robertson and Orden (1989) used data from New Zealand and provide similar evidence on the effect of money on agricultural prices.
>
> Saghaian et al. (2002) utilized US monthly data suggesting that agricultural prices do overshoot their long run equilibrium, with the extent of their 'overshooting' being determined by the share of 'sticky' prices in the price index. In other words, the higher the share of manufactures in output, the heavier the burden of adjustment borne by commodities. Their empirical work also suggests that, in an open economy, and given an increase in money supply, the exchange rate depreciates rapidly, also overshooting its long run equilibrium level.
>
> More recently, Awokuse (2005) concluded that money changes have little direct impact on agricultural prices in the United States, with prices being determined by exchange rate movements and changes in input costs. Frankel (2008) used 1950–2005 data from the United States and showed that the relationship between interest rates and commodity prices, including sugar, soybean oil and maize, is negative. Asfaha and Jooste (2007) provided evidence of agricultural commodity prices overshooting in South Africa. Gilbert (2008), utilizing recent data, focused on the impact of the world monetary supply on international food prices and attributed causal impact to monetary factors.

slumps are closely related to credit cycles in a sequence that has been historically stable. Upswing of prices are driven by events that provide new opportunities for investment. Such investments are financed by borrowing, and accommodated by loose monetary policy, as well as by financial and credit instrument innovation. The boom may end due to a number of reasons including the tightening of money and the related increase in interest rates, excess debt, or by the informational asymmetry of risky financial assets which leads to judgment errors.

Figure 2 – FAO food price index and US Federal funds rate (Jan 2005 - Dec 2008)

Federal funds rate (left axis)
FAO food price index (right axis)
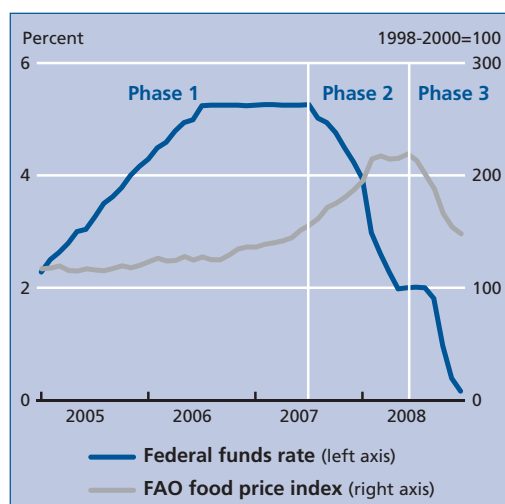
Source: FAO and US Federal Reserve

The 2007–08 price boom and slump follows such a sequence of events. The rapid economic growth in Asian economies caused a strong demand for metals and energy with non-food commodity prices increasing after 2004. Food commodity prices were affected at a later period, mainly through the increased derived demand for crops by the biofuels sector. The role of money in affecting food prices during the period 2004–2007 is not quite clear. Figure 2 shows the relationship between the FAO Food Price Index and the United States Federal Funds rate during the period 2005–2008. During the first phase of the price episode between 2005 and 2007, the Federal Funds rate increased from 2.75

percent in 2005 to 5.25 percent in the third quarter of 2007, reflecting a tightening of money supply during a period when commodity prices were following an upward trend. This suggests that the impact of the money supply tightening was offset by other factors (Phase 1 in Figure 2).

It is possible that rapid increases in the demand for biofuels, triggered by the growth of Asian economies have more than offset the negative effect of high interest rates on food prices. In addition, increases in food prices may have contributed to building a premium in the convenience yield of inventory holding, with firms being willing to hold inventories despite the relatively high interest rates. Another explanation is provided by Gilbert (2008) who stresses that the relationship between interest rates and prices may depend on the likely duration of inventory holding, which determines the return on storage. Inventory holding is longer in periods of excess supply rather than excess demand, which indeed characterized the period 2004–07.

Gilbert (2008) also indicates that the transmission of monetary changes to commodity prices can vary over time with the impact being realized after long lags. His empirical work suggests that, on average during the period 1990–2008, the world money supply did affect food prices. Nevertheless, the above discussion suggests that in the early phase of the food price upswing, food prices were driven mainly by rapid economic growth, the subsequent rising trend in oil price, and strong derived demand for crops from the biofuels processing sector. The rate of increase in food prices accelerated during 2007 as food supplies tightened within an economic environment characterized by the financial crisis and the collapse of the United States subprime mortgage markets. During this beginning of a second phase of the food price upswing, monetary factors contributed significantly to food price behaviour. The financial crisis occurred after two years of rising interest rates which resulted in a default on a significant proportion of subprime mortgages in the United States. This spilled over throughout the world through changes in the value of securities collateralized by these mortgages. These structured mortgage-backed investment vehicles merged the risk of subprime borrowers with that of credit-worthy ones, and other underlying assets, reflecting an innovation in financial instruments in line with Bordo's (2008) insight on credit market booms and slumps. The result of these mortgage-backed derivatives was a shift of risk away from the mortgage-originating banks to the financial sector. This increased the exposure of financial institutions to shocks in the subprime mortgage sector, while at the same time weakened the incentive to monitor borrowers.

The major problem caused by the subprime mortgage sector crisis was a drying up of inter-bank lending caused by uncertainty about the impact of the mortgage-backed derivatives on financial institutions. Ascertaining the value of such derivatives and their effect on portfolios is complex and so the crisis resulted in increasing counterparty risk, with creditors being unwilling to extend loans to institutions that did not have accurate information on their solvency. As a response, the US monetary authorities increased the supply of money, thus providing liquidity and acting as a lender of the last resort.

This policy response led to a decrease in the Federal Funds rate from 5.25 percent (August 2007) to 3 percent (January 2008). The rate decreased further to 2 percent in July of the same year (Phase 2 in Figure 2). The reduction in interest rates led to a sharp depreciation of the US dollar. Taylor (2008) suggests that low interest rates also had a rapid effect on the price of oil, which increased dramatically from US$60 per barrel to US$140 per barrel during the summer of the same year. Such a transmission of monetary expansion to the price of oil is in line with the theory on the negative influence of interest rates on commodity prices and the empirical evidence on 'overshooting'. Frankel (2008) provides additional empirical evidence supporting a short-run negative relation between interest rates and the 'desired'

oil inventories, thus taking into account the impact of increased industrial activity on the inventories. Figure 2 (Phase 2) shows that the rate of increase of prices of food commodities also accelerated rapidly during the second phase of the price episode, thus supporting the argument that low interest rates influence food prices. Food prices reached historically high levels in July 2008 with their trend being also determined, among other factors, by the link of food and energy markets through the ethanol sector. Overall, this second phase of the food price upswing appears to be determined by monetary and financial factors, in conjunction with tight food commodity markets.

In addition to the impact through interest rates, Taylor (2008) also suggests that there was an important exchange rate effect. On the whole, the depreciation of the dollar appears to be responsible for a small part of the increase in food prices. Evidence provided by the International Monetary Fund (IMF) suggests that if the US dollar had remained at its 2002 level, oil prices would have been lower by US$25 per barrel, and the increases in non-fuel commodity prices would have been lower by only 12 percent (Lipsky, 2008).

Additional analysis is provided by Caballero, Fahri and Gourinchas (2008) which helps to further comprehend the abrupt nature and the magnitude of the food and non-food commodities price increases during the second phase of the upswing after January 2008. These researchers stress that the rapid increase in commodity prices, and especially oil, after the subprime mortgage market collapse, can be further explained by excess demand for assets from emerging economies. The argument is based on structural problems of the global financial system arising from the under-development of the financial markets in emerging countries. This inevitably resulted in excess demand for US assets and large capital flows toward the United States. The collapse of the subprime mortgage market and the spillover of the crisis into the financial sector obliterated many investment vehicles, thus exacerbating global asset scarcity. Emerging economies and commodity producers, among the latter investors from oil exporting countries, continued to seek financial assets in the United States, transforming commodities into investment assets through operating in commodity futures markets.

In order to test the asset-role of oil, Caballero, Fahri and Gourinchas (2008) used data for the period 1984–2008 and regressed oil prices on the value of assets that were negatively affected by the financial crisis and the US industrial production. Their results suggest that a decline (increase) in stock prices results in an increase (reduction) in the price of oil as funds are reallocated to commodities. When using data of monthly frequency, the elasticity of oil with respect to stock prices is estimated to be nearly equal to -3.0, suggesting a strong negative relationship between financial assets and oil. This elasticity reflects the possibility of a significant allocation of funds to commodities. This is not entirely surprising, since both financial assets and commodities are characterized by flexible prices.

The findings on the relationship between commodities and financial assets can be further supported by the increasing presence of institutional investors in both food and non-food commodity futures markets. Their role as speculators in food futures markets is discussed in the next sub-section in more detail, however, it is reasonable to note that food markets, given their link with the energy sector through biofuels, provided an alternative investment asset, and accommodated the flight towards commodities and oil. The results of Caballero, Fahri and Gourinchas (2008) suggest that futures markets provide, together with the interest and exchange rates, a third channel for the transmission of shocks from the monetary and financial sector to food markets. It is also likely that futures may constitute the main transmission mechanism of monetary changes to food commodities, as the impact of low interest rates, through the accumulation of physical inventories, may not have been significant given the tight commodity markets (Gilbert, 2008).

As the financial crisis spilled over into the United States and Europe, the curtailing of inter-bank lending led to financial distress. This process culminated with the dramatic collapse, and rescue, of many financial institutions and the failure of Lehman Brothers in September 2008. The freezing of inter-bank lending caused commercial banks to be hesitant to release capital and extend credit to firms, despite low interest rates offered by central banks. They were also hesitant as they were in the process of restoring their balance sheet from the damage. As a result, the financial crisis spilled over to the real economy, which was already hit by high oil prices. The slow-down in economic growth all over the world, as well as expectations that a major recession was in arrival, caused an abrupt collapse of oil prices from US$140 to under US$60 per barrel. Food commodity prices, already under downward pressure from bigger crops, were also significantly affected, falling in September 2008 by about 50 percent from their peak levels in June of the same year (Phase 3 in Figure 2).

2.4 SPECULATION AND INVESTMENT FUNDS

Agricultural futures prices increased dramatically over the period 2005–2008, and the question whether the recent food price episode is a phenomenon similar to a 'speculative bubble' lingers in the minds of many observers (Figure 3). The incidence of such a bubble in food markets is, in theory, a possibility with traders following the price trend and buying into increasing prices to obtain short run gains. In food and non food commodity markets, speculation exerts upward pressure on futures prices, which, in turn results in spot price increases that do not correspond to the fundamental determinants of supply and demand. Indeed, increased trading in commodity futures distinguishes the recent commodity price episode from that of the 1970s.

Evidence against the conjecture that speculation in futures fuelled the food price upswing is that prices of commodities for which futures markets do not exist (copper, iron, and ore) or for which futures markets are unimportant (steel), have increased as much as the prices for commodities that are traded in futures. Similarly, rice, for which futures' trading is less important, participated in the food price upswing.

Figure 3 - Increases in commodity futures prices (March 2003 - March 2008)
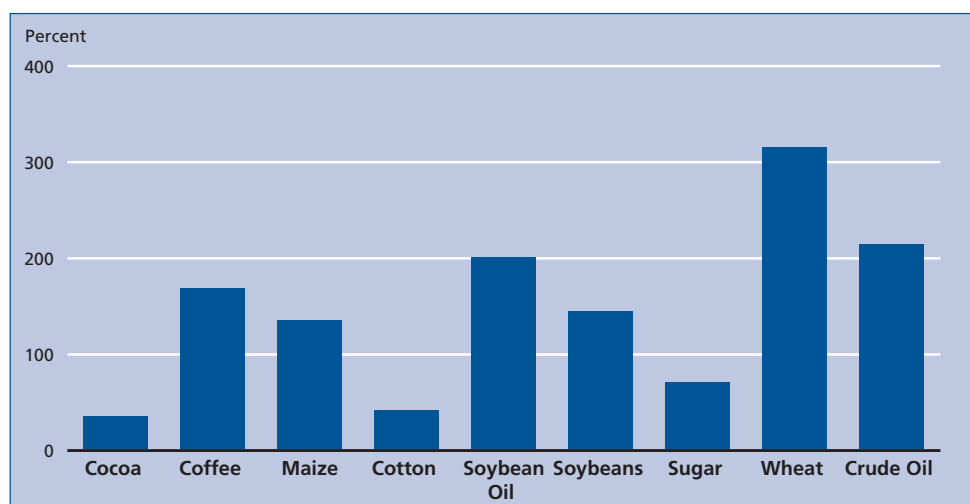
Source: Bloomberg Financial Data

Futures markets perform two essential functions. First, they facilitate the transfer of price risk and increase liquidity between agents with different risk preferences, such as commercial and non commercial traders. The second major economic function of future markets is price discovery. Commercial traders, including producers and processors of agricultural commodities, utilize futures contracts to insure their future inventories against the risk of fluctuating prices. Non commercial traders, such as speculators, operate in futures markets for possible gains from futures prices increases. What speculators gain is a risk premium from commercial traders for assuming the risk of future price fluctuations by demanding a futures price that, by the contract's maturity, will lie below their expected cash or spot price. Price discovery reflects the continuous process by which futures prices are reassessed by traders as new information becomes available. If the majority of traders have good knowledge of the market and share the same information, this information becomes embedded into the price. Worldwide, physical commodity markets tend to utilize the information contained in futures prices because it reflects global market conditions and it is readily available.

Commercial traders tend to be well-informed, while speculators do not have precise information of the physical market. Although it is possible that speculation may have exacerbated the increase in commodity prices, financial theory predicts that speculation by uninformed traders, who in general take short-term future positions, has no or short-lived impact on futures prices. If prices drift away from their value determined by market fundamentals due to speculative activity, then informed traders will take advantage of such a profitable opportunity and arbitrage may result in prices stabilizing at their fundamental value. In addition, speculative activity is more likely to be observed in the non food commodity markets, such as oil and metals, rather than in agricultural markets. In agricultural markets, supply and demand responses are, in general, large and rapid, thus possibly deterring speculators from investing for short-run gains.

Gilbert (2008) uses recent data from January 2007 to late 2008, including the period of rapid increases in the first half of 2008, in order to test whether speculative behaviour or 'buying into the increasing trend' resulted in spikes in the futures prices of maize, wheat and soybean. His results suggest that there were some spikes in the futures prices during some of the months in this period. However, futures prices, in general, followed a smooth upward trend with no signs of significant explosive spikes. In conclusion, there is some evidence that food prices may have surged due to speculation and buying into the trend. However, the empirical evidence suggests that these speculative 'bubbles' have probably been short-lived. An alternative view to the one that the price upswing is the outcome of speculation, professes that investors are followers – not leaders – with increasing prices caused by increased investment activity, rather than vice versa. Earlier evidence provided by IMF (2006) suggests that speculative activity does not affect price levels with the possible exception of oil, where the impact is small but significant.

Although, the evidence suggests that short-term speculation did not, in general, affect food prices, this decade has witnessed a significant increase in commodity futures trading by a new class of traders composed of institutional investors, such as pension funds, university endowments, banks and sovereign wealth funds. These investors regard commodity futures as an asset class, comparable to traditional asset classes such as equities, bonds and real estate, and trade taking long term positions. Their behaviour in futures markets differs from that of traditional short-term speculators in several ways:

• first, they engage in trading by taking positions on a number of commodities as a group, rather than in specific futures markets, basing their decisions on the valuation of risk and expectations for returns in excess of the risk premium. As these commodity groups are represented by commodity futures indices, such as the Goldman Sachs Commodity Index

Table 1 - Goldman Sachs Commodity Index components, June 2009

COMMODITY	SHARE	COMMODITY	SHARE
Energy, total	68.84	**Precious Metals, total**	3.32
Crude Oil	37.92	Gold	2.99
Brent Crude Oil	13.35	Silver	0.33
RBOB Gas	4.83	**Agriculture, total**	15.35
Heating Oil	4.21	Wheat	3.86
Gas Oil	4.51	Red Wheat	0.81
Natural Gas	4.02	Corn	3.47
Industrial Metals, total	7.25	Soybeans	2.64
Aluminium	2.3	Cotton	1.15
Copper	3.13	Sugar	2.26
Lead	0.46	Coffee	0.77
Nickel	0.75	Cocoa	0.39
Zinc	0.61	**Livestock, total**	5.24
		Live Cattle	3.04
		Feeder Cattle	0.61
		Lean Hogs	1.59

Source: Goldman Sachs

(S&P GSCI) and the Dow Jones AIG commodity index (DJ-AIG), institutional investors are often called index speculators;

• second, these institutional investors take long positions, 'buying and holding' futures, as opposed to short positions taken by the traditional speculators who buy and sell rapidly.

Table 1 presents the components and dollar weightings of the S&P GSCI. Each commodity is weighted according to the worldwide production during the last five years. This is done in order to reduce the impact of inflation of the futures returns, as an increase in the price of energy, which constitutes nearly 69 percent of the index, will have a large effect on the inflation rate. Total agriculture and livestock consist of just over 20 percent of the index. The DJ-AIG index is based on a different weighting method which, in addition to production, it considers the amount of trading.

There are a number of reasons that explain why institutional investors are interested in commodity futures. Commodity prices are negatively correlated with returns from equities and bonds and therefore consist of an attractive vehicle for portfolio diversification that reduces the volatility of portfolio returns. In addition, commodity futures prices present a safer asset in an inflationary environment, as they tend to increase in line with the general price level in the medium and long run.

Gorton and Rouwenhorst (2004) provide empirical evidence on why commodity futures have become a new 'asset class', comparing the returns from investing in indexed commodity futures with the returns from investing in stocks and bonds. Their findings suggest that during the period 1959–2003, investment on indexed commodity futures far exceeded the

returns from holding physical commodities and that commodity futures prices outpaced inflation. The authors corroborate that commodity futures are negatively correlated with other assets, such as equities and bonds, with the negative correlation tending to increase with the holding period. This indicates that portfolio diversification is more effective the longer the horizon of investment on commodity futures is.

Comparisons between commodity futures returns and those of stocks and bonds also reveal that commodity futures and stocks have similar returns, amounting to about 5.2-5.6 percent per annum, a rate which is twice as high as the return from investing in bonds. Gorton and Rouwenhorst (2004) also suggest that stock returns have a higher variance and also hold more downside risk than commodity futures. Evidence is also provided on the relationship between commodity futures prices and inflation. Although traditional assets may be thought of as better hedges to inflation, unexpected inflation is associated with negative shocks to aggregate output and thus tends to negatively affect returns from stocks. On the other hand, commodity futures prices tend to outpace the inflation rate as they include information on the future trend in commodity prices. The above observations suggest that commodity futures are not only regarded as providing insurance for the future values of outputs or inputs, but also as an asset which provides returns and can be used to diversify traditional portfolios. However, it is important to note that the return to commodity indices also contain the return to the collateral used, that is purchased US Treasury bills and that agricultural futures contracts comprise about one fifth of such investments[2].

Figure 4 shows that the average daily amount of commodity futures open interest, which is the total amount of outstanding contracts, increased from US$90 billion in 2002 to US$699 billion in 2008. While the bulk of this money is invested in non-agricultural, especially energy, futures, investments in agricultural futures marked a significant increase from 2007 to 2008, a period with rapid increases in food prices. Agricultural commodities' open interest in 2008 amounted to US$165 billion, as compared with US$103 billion in

Figure 4 - Average daily amount of open interest (2002 - 2008)
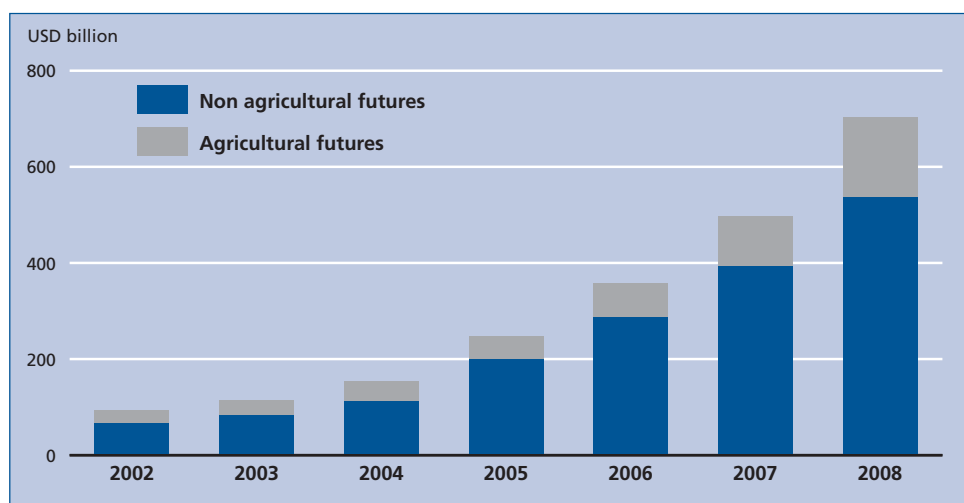
Source: CFTC Commitments of Traders CIT

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[2] The investor guarantees a continuing right to purchase futures contracts by fully collateralizing the contract with government bonds (US Treasury bills) of a value equal to the face value of the futures contract. Therefore, the return of the fully-collateralized futures consists of the Treasury bill rate, as well as the return for holding the futures contract.

2007. Such rapid increases in agricultural futures investment have raised questions on whether the food price spike was a phenomenon similar to a financial 'bubble', where price changes are not justified by market fundamentals and the information available at the time, taking the form of a rapid increase followed by a sharp decline.

The amount invested in agricultural and other commodity futures is not the only argument for how commodity funds have contributed to food price increases.

Another issue on the role of commodity funds in affecting futures prices relates to the insensitivity of these investments to price changes. Masters (2008) argues that commodity funds investments are made irrespectively of expected future price movements and thus amplify price increases, without providing new information to contribute to the formation of the fundamental value of the commodity. Whatever the case may be, complete lack of adjustment to changes in expectations is unlikely. Commodity funds take positions on a range of commodities, both food and non food, and thus investments may be independent of market fundamentals and expected price movements in some of the markets. This contrasts with the behaviour of commercial traders and traditional speculators who trade in specific markets. Adjustment to price expectations, however, is likely to be slow as it requires changes in the entire portfolio.

The above arguments on the role of commodity funds have been empirically analyzed by a number of researchers, although evidence on the impact on agricultural futures is sparse. Irwin and Holt (2004) examined the impact of hedge and commodity funds on a number of commodity prices including soybeans. They found little evidence of buying into the price trend, a traditional speculative behaviour, while they concluded that, on average, funds invest in line with expectations on market fundamentals. Other researchers examined the role of commodity funds in the context of energy futures (Haigh, Hranaiova and Overdahl, 2005; Haigh and Overdahl, 2007). Their results show that commodity funds do not trade actively and do not change their positions as frequently as other traders. The findings also suggest that, on average, changes in commodity funds positions are triggered by position changes of other participants in the markets, especially hedgers. In this manner, the direction of the causal relationship runs from changes in the price to a change in commercial traders' and subsequently to commodity funds' positions.

Although the findings on the role commodity funds in the energy markets provide some evidence against the distortion of futures prices, research on their impact on agricultural markets is sparse and the issue awaits more data and analysis. Plato and Hoffman (2007) analyzed the impact of soybean futures prices on spot markets using data covering the period 1982 to 2005. They conclude that in the period that commodity funds are active, the price discovery function of the futures market improves, along with increases in futures trading. This result provides evidence that long-term futures trading contributed to the fundamental value of the spot soybean price without being a factor in forming a temporary 'bubble'. Again, the findings do not support the argument that commodity funds have distorted prices, at least during the 2000–2005 period, suggesting that the price upswing was the result of informed expectations on market fundamentals.

In order to substantiate the role of commodity funds in the recent food price episode, one has to unravel the direction of the causal effect between the funds' value and futures prices. Gilbert (2008) suggests that commodity funds could have an impact on less liquid markets and uses weekly data from January 2007 to August 2008 to test whether changes in their positions, as well as those of other non commercial traders, caused changes in the weekly prices of nearby futures of maize, wheat, soybean and

soybean oil. The findings suggest that there is no causal link between futures prices and the commodity funds' positions and those of other non-commercial traders in the maize, wheat and soybean oil markets. Nevertheless, the result for the soybean market provides some evidence that commodity funds may cause nearby futures prices to have a positive and persistent effect.

Although, on average, empirical research on energy futures tends to provide statistical support against the hypothesis that commodity funds have distorted price information, Gilbert (2008) provides some evidence that these investments may have contributed to agricultural price increases. Nevertheless, it is important to note that the empirical results do not only depend on data availability, but also on the manner in which the net positions of different types of traders are averaged and organized for analysis. More research is necessary in order to unravel the impact of commodity funds on agricultural markets.

On the whole, agricultural markets are smaller and significantly less liquid than energy or metals markets. Although they account for a smaller share of commodity funds investments, the value of these investments as a whole is large as compared to the size of each individual commodity market (see Figure 5). Agricultural futures markets respond hastily to new information and in the short run, it is possible that such investment activities have an impact on prices, especially when markets are tight. Therefore, it is likely that large investments result in the prices becoming distorted for short periods of time. One would expect that in the less liquid agricultural futures markets, the trading of large amount of contracts could increase the incidence of abrupt price changes and thus volatility. However, the empirical evidence thus far, suggests such piece spikes may be short-lived.

In addition, as institutional investors regard commodities as an asset class and invest in indexed commodity futures, their response to changes in individual markets may not always have been in line with market-specific fundamentals. Energy futures, which constitute the larger part of commodity indices, may dominate investors' behaviour, thus transmitting upward (or downward) movements in the price of oil to other commodities and increasing the correlation across all commodity futures markets, and providing another avenue through which the energy and food markets link.

Figure 5 – Maize and wheat futures markets open interest: Shares by type of investor
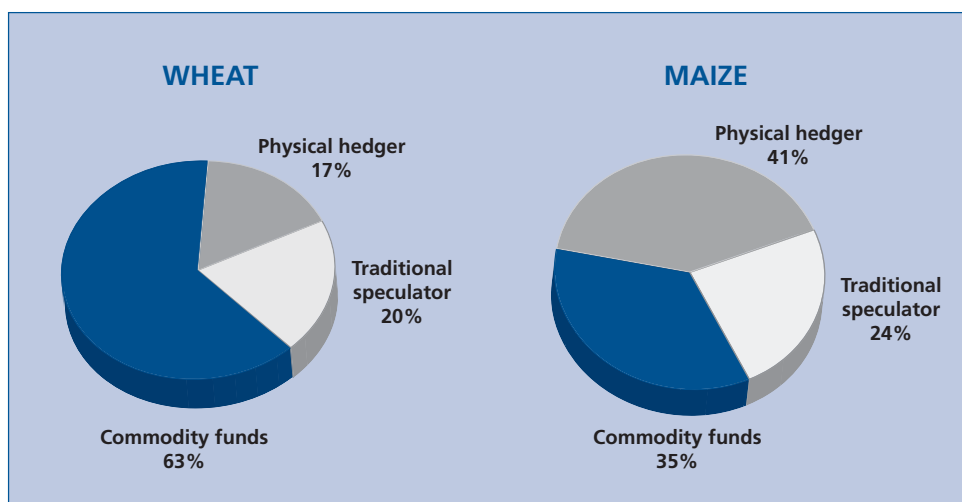
Source: CFTC Commitments of Traders CIT, adopted from Masters (2008)

In summary, there is some statistical evidence on short-lived speculative bubbles, as well as on the impact of commodity index-based investors on agricultural futures. However, it appears that futures markets, in general, may have provided the main channel for the transmission of monetary changes to commodities, with investors adjusting their portfolios and moving into commodities when the returns of other financial assets ceased to provide an attractive investment vehicle (Gilbert, 2008).

2.5   SUMMARY

The behaviour of food prices has been shaped by a number of factors. Food market fundamentals, decreasing global food stocks, rising production costs, escalating energy prices and the expansion of biofuels production, changes in the money supply and the depreciation of the US dollar, as well as changes in agricultural futures trading, all have contributed to the recent food price boom and slump. This section focused primarily on the exogenous triggers of the price episode, namely the global economic growth and the subsequent increases in oil price, as well as the macroeconomic factors and the manner by which their impact was transmitted to agricultural markets.

The rapid economic growth contributed significantly to the food price upswing mainly through strong demand for crops by the ethanol processing sector. The slowdown of the global economy and the subsequent contraction in the demand for energy significantly weakened the relationship between food and energy prices, with crop prices being determined, since the end of 2008, by the food market fundamental relationships only.

Nevertheless, the recent price episode highlighted the integration of the food and energy markets through the biofuels sector, and the nature of the relationship between the prices of oil, biofuels and food. This has added another dimension on how food prices behave. Increases in the price of energy, especially if oil prices rise above a certain level, are likely to have an effect on the price of food. In the medium and longer run, this particular aspect of the relationship between energy and food prices suggests that shocks to the energy market are likely to be persistent, at least until agriculture improves significantly its buffer capacity worldwide. Such a relationship may be expected to increase price variability in food markets.

Macroeconomic factors and more specifically monetary expansion can also be thought of as the major driver of rapid increases in commodity prices. The discussion in this section highlighted that changes in the supply of money have influenced commodity prices through three channels, namely changes in the interest rates and their effect on inventories, exchange rates and futures markets. Recent literature was reviewed and the discussion suggested that food prices have not been exempt from the effect of money on commodities. The presence of institutional investors in agricultural futures markets and their trading behaviour was also analyzed. There is sparse statistical evidence on the role of commodity funds in the food price upswing. The literature so far suggests that commodity funds may have contributed to the recent food price episode. However, speculative 'bubbles' in food prices were found to be short-lived, mostly adding to price variability, rather than determining the level of prices.

Chapter 3
Price transmission in Eastern and Southern Africa

A fundamental issue when analyzing the impact of the recent food price episode is the extent to which prices in developing countries respond to price shocks in the international market. Price transmission between food markets is central in assessing the impact on producers and consumers and understanding how do they adjust to price shocks. In general, the absence of market integration or of complete pass-through of price changes from one market to another has important implications for economic welfare. Most developing countries are subject to incomplete price transmission either due to trade and other policies, or due to high transaction costs arising from poor transport and communication infrastructure. Poor transmission results in a reduction in the price information available to economic agents and leads to decisions which contribute to less elastic demand and supply responses.

Across countries, domestic prices for food exhibit diverse patterns of price transmission from international prices. Often, the impact of international prices on rural household income variability seems to be small. In this case, producers and consumers are subject to price variability mainly due to domestic shocks. Especially in Africa, food prices exhibit wide variability that arises from seasonality and climatic phenomena. Increased exposure to international markets may result in a reduction in agricultural income volatility, as international markets may act as 'buffers' absorbing large domestic supply and demand shocks. In other years, during periods of world price increases, as that experienced in 2007 - 08, imperfect price transmission may shield countries from external shocks. This poses a policy dilemma highlighting the need for policies to achieve an optimal degree of transmission depending on the two types of shocks.

The purpose of this section is to highlight a number of issues related to market integration and the transmission of price signals from the international market to developing countries. The analysis presents evidence on the extent of international maize price pass-through to a number of countries in Eastern and Southern Africa, namely South Africa, Kenya, Zambia, Malawi and Uganda. The analysis suggests that most of the maize markets in the countries under examination are integrated with the international market in the sense that domestic maize prices co-move with the international market price in the long run. In the short run, international price changes do not affect the price of maize in Southern and Eastern Africa, either instantaneously or within a period of one or two months.

3.1 HOW ARE PRICE SIGNALS TRANSMITTED?

Studies on the transmission of price signals are based on the concept of competitive pricing. The classical paradigm of the Law of One Price suggests that, in the long run, price transmission is complete with prices of a commodity sold on competitive foreign and domestic markets differing only by transport costs. Such a complete price pass-through is attained through trade and reflects the integration of markets. Changes in supply and demand in one country will affect prices which in turn will instigate trade with other countries. As arbitrage and trade restores the market equilibrium, prices in the domestic market tend to equalize with those in foreign markets except for transport costs – hence the term 'Law of One Price'.

In practice, price transmission can be slow, or far from complete due to a number of reasons including the implementation of policies, transport costs, non competitive supply chains and consumer preferences.

3.1.1 *Policies*
In general, the implementation of ad valorem import tariffs, or export taxes allow international price changes to be fully transmitted to domestic markets in proportional

terms in the absence of other costs. Nevertheless, prohibitively high tariffs or taxes eliminate opportunities for arbitrage and result in domestic and international prices moving independently of each other, as if an import or export ban were implemented.

In the context of the recent food price hike, many governments in developing countries have implemented short run border measures, such as import tariff reductions or exports bans, in order to curb domestic price increases and shield consumers from increased food expenditure. Such decreases in import tariffs facilitate price transmission, especially if tariffs were initially set at high levels. For food exporters, export bans, if effective, hinder the transmission of price signals from the international market, preventing the domestic price level from rising.

Policies that aim to stabilize domestic prices at a certain level are often implemented in conjunction with border measures. Government intervention in the form of food commodity procurement or sale and inventory management is commonly practiced across African countries. Such policies impede price transmission depending on the government's price targets, its capacity and budget to realize food purchases at certain price levels and its ability to manage food inventories and trade continuously. Even then, depending on domestic market fundamentals, trade takes place and the international and domestic prices may not be completely unrelated, with the intervention policy resulting only in weak international price pass-through.

A number of the countries examined in this section implement price stabilization policies. In Kenya, the state-run National Cereals and Produce Board (NCPB) is involved in procurement of domestically produced maize and inventory management. In Malawi and Zambia, the Agricultural Development and Marketing Corporation (ADMARC) and the Food Reserve Agency respectively maintain a strong presence.

3.1.2   Transport costs

Apart from policies, domestic markets can also be partly insulated by large margins that arise due to high transport and marketing costs. Especially in developing countries, poor infrastructure, transport and communication services give rise to significantly high costs of delivering the locally produced commodity to the border for export or the imported commodity to the domestic market for consumption. Such high margins hinder the transmission of price signals. As a consequence, changes in international prices are not fully transmitted to domestic prices, resulting in producers and consumers adjusting, if at all, only partly to shifts in global supply and demand.

3.1.3   Non-competitive value chains and consumer preferences

Oligopolistic behaviour and collusion among domestic traders may keep price differences between international and domestic prices on levels higher than those determined by transport costs. Concentration in the food marketing and processing sectors and imperfectly competitive behaviour beyond the farm-gate implies that processors or middlemen may have power over prices. Therefore, they may exercise pricing strategies that result in a quick and complete pass-through of increases in the international price and a slow and incomplete transmission of decreases in the international price to domestic prices upstream, as their margins are squeezed.

Consumer preferences may also result in incomplete price transmission even under competition and free market conditions. Domestically produced food often has different attributes than those characterizing internationally traded food commodities. If consumers preferred the attributes of the domestically produced food, the possibilities of substitution in consumption between domestic and imported foods would be limited. In Eastern and

Southern Africa, consumers generally prefer white maize rather than the internationally traded yellow maize. As consumers are unwilling to substitute one type of maize for another, domestic maize prices may depend mainly on regional supply and demand shocks for white maize, rather than global market conditions. If transmission were found incomplete, some white maize producing countries may have experienced increases that are due to domestic market fundamentals and not due to the upturn of the international price of yellow maize.

3.2 PRICE TRANSMISSION MODELS

Price transmission analysis is an empirical exercise based on econometric modeling. Econometricians describe the data and use it to quantify economic relations which represent the structure of a market in a model. These models are used to provide policy advice and generate forecasts. Price transmission analysis adheres, more or less, to the above sequence of tasks and it is often based on a statistical toolkit called vector autoregressions, or VARs. Vector autoregressions provide the basis for capturing the rich price dynamics in both the short and the long run, while in the context of price transmission, these models provide a basis for assessing the correlation between prices of different markets, understanding the nature of the relationship between them in time and, consequently examining the extent of price pass-through.

This kind of analysis falls short of providing a description of the structure of the market which gives rise to the prices. The latter is a formidable task, as it entails the modelling of a large number of economic relationships. For each country under examination, functions that explain total utilization, arbitrage, in terms of trade volumes and trade flows with partner countries, as well as public and private inventory behaviour have to be estimated resulting in very high data requirements that cannot always be met when analyzing developing countries' markets.

Vector autoregressions have significantly lower data requirements and in order to assess price pass-through one needs data on domestic market and international market prices only. VARs provide interesting information in terms of a number of ingredients or attributes of price transmission, such as long run price co-movement, short run effects, the process by which prices adjust to each others and the direction of the flow of price information. As VARs are a purely statistical tool, these attributes have to be considered within the context of the market in the country under examination, and it is important to note that such models do not provide an unambiguous measure of price transmission, as for example in terms of a single parameter, but shed light to a number of aspects of the price relationship[3].

In brief, VARs and the statistical toolkit allow us to assess price transmission by:

- testing for price co-movement, or long run equilibrium between international and domestic prices;
- examining the short-run dynamics and the adjustment to the prices' long run relationship; and,
- finding the direction of the flow of price information from the international to the domestic markets.

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[3] For a comprehensive review of the modeling technique see Rapsomanikis, Hallam and Conforti (2006).

Co-movement can be thought of as a long run linear equilibrium relationship between prices which is determined by arbitrage and market forces. In the short run, these prices may affect each other or may drift apart, as shocks in one market may not be instantaneously transmitted to other markets. In this case, market forces will ensure that these divergences from the underlying long run relationship are transitory and not permanent.

Assessing the speed of adjustment to equilibrium provides information on the pace with which changes in prices in the international market are filtered to domestic markets. Complete adjustment to shocks in short periods of one or two months is not impossible to observe, but it is a characteristic of large and efficient markets. In developing countries, with national and regional markets that are separated by poor transport and communication infrastructure, adjustment is slower. For example, in export-orientated sectors in Africa, such as the Ethiopian coffee market where price discovery is based on an efficient auction system, full adjustment of the price of Ethiopian arabica coffee to the international coffee price takes place in 3.7 months (Rapsomanikis, Hallam and Conforti, 2006).

Price information is vital for the efficient functioning of a market. Large physical markets, auctions and commodity exchanges react to new information in international prices, but also provide information to smaller physical markets. In many countries, trade is facilitated by using prices from futures exchanges as a benchmark for setting the price for physical transactions. As information flows from one principal market to another smaller market, any shocks will also be transmitted, given that these markets are integrated. As shocks in smaller markets are caused by the shocks in larger markets, causality provides additional information on price discovery and evidence as the direction to which price transmission is occurring.

3.3 EVIDENCE ON PRICE TRANSMISSION IN EASTERN AND SOUTHERN AFRICA

In general, food prices in Eastern and Southern Africa are quite volatile. A variety of reasons, such as weak supply response, low productivity, climatic shocks and poor infrastructure, which often isolates regions and countries, all lead to increasing price variability, thus

Figure 6 – Maize prices (January 2004 - November 2008)
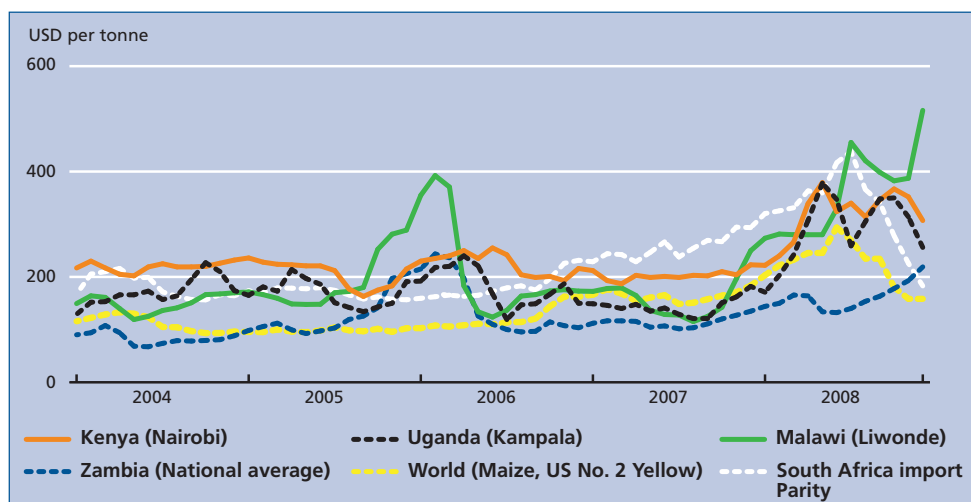
Source: International Financial Statistics, SAFEX, National Governments

presenting major challenges for governments. Consumer preferences over maize varieties, are also thought of as the main factor that insulates markets in the region making them subject largely to domestic shocks.

In spite of the above reasons, prices for white maize in several markets in Eastern and Southern Africa have moved in line with the world price of yellow maize, following an upward trend from the beginning of 2007 until the peak of July 2008 (see Figure 6). As world prices collapsed in the summer of 2008, prices in most African countries followed, although not immediately and at varying rates of change. Indeed, during the last decade domestic prices have often moved towards import parity levels, suggesting that African white maize markets are becoming increasingly integrated with the international market of yellow maize.

Market experts suggest that the region may be characterized by a structural deficit in the trade of maize (Jayne, Zulu and Nijhoff, 2006). Such a deficit, which is also reflected in Figure 7, may result from the lack of technology and low productivity in many countries in the region, the reduction in exportable surplus in South Africa, the only reliable maize exporter in the region, and the transformation of Zimbabwe from an exporter to an importer.

Jayne, Zulu and Nijhoff, (2006) suggest that the maize structural deficit in the region results in domestic prices moving towards import parity with increasing frequency. Such a shift in the behaviour of domestic maize prices may reflect the likelihood that these markets are indeed integrated with the international market in spite of the differences in the varieties consumed. Over the past decades, population increases have outpaced increases in the production of maize, and as a result most countries in the region have become net importers (see Figure 7).

3.3.1 *South Africa: Do yellow and white maize prices co-move?*
The relationship between prices of yellow and white maize is of central interest for Eastern and Southern Africa. Co-movement between the price of locally produced white maize and that of the internationally traded yellow maize would imply that these markets are integrated and consequently, in the long-run, the international maize price upturn would be likely to affect white maize markets in these regions. On the other hand, lack of

Figure 7 – Eastern and Southern Africa: Aggregate net trade (1995-2006)
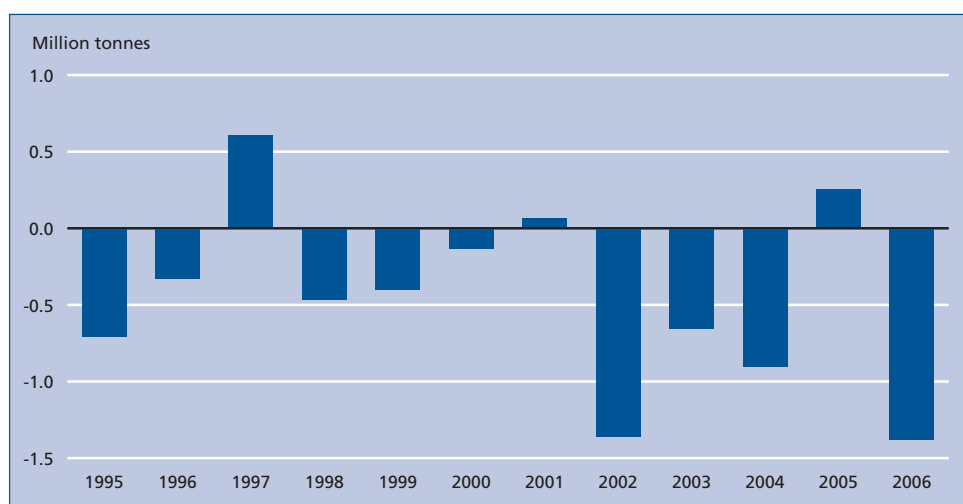
Source: FAO

Table 2 – South Africa: Price transmission

	SAFEX YELLOW MAIZE PRICE	**SAFEX** WHITE MAIZE PRICE
Evidence for co-movement with:		
> International price	Strong	Strong
> SAFEX yellow maize price	-	Strong
Causality	World → domestic	World → domestic
Months to full adjustment to international price	7.8	7.2

co-movement would mean that increases or decreases in the international yellow maize price do not affect the Eastern and Southern African white maize markets.

South Africa produces and trades both yellow and white maize and its futures exchange, the South African Futures Exchange (SAFEX) offers an efficient mechanism for trade and provides information on prices within a competitive market environment with minimum government intervention. SAFEX offers futures contracts on maize and provides traders in Southern Africa with a benchmark for pricing physical trade.

Co-movement was tested between price pairs formed by the South African SAFEX spot prices for both yellow and white maize and the US yellow maize No. 2, Gulf, reflecting the international price. The tests were performed utilizing monthly data from January 1998 to July 2008. There is strong evidence that South African prices of both yellow and white maize co-move with the international price in the long run. In the short run, there is no significant evidence that international prices affect the SAFEX yellow and white maize prices either instantaneously or with some delay of one or two months.

Both SAFEX prices adjust to their long run equilibrium with the international price slowly, with full adjustment to international price shocks taking approximately between 7 and 8 months. Overall, there is strong evidence that the South African maize markets are integrated with the international market in the long run. The relatively slow adjustment to international price shocks, however, suggests that domestic market fundamentals are important in determining maize price behaviour in South Africa. In the short run, South African and world maize prices can drift apart, in spite of sharing the same underlying long-run trend.

3.3.2 *Kenya*
Kenya is an important producer and consumer of maize with a net importing position during the period 1998–2008. South Africa and the United States account for the larger share of imports, while other African countries in the Eastern and Southern African regions also export maize to Kenya. Import tariffs and high transaction costs have combined to result in high maize prices, as compared to price levels of the international market.

For all Kenyan markets examined, the analysis provides strong evidence that prices co-move with the international price in the long-run. In Eldoret and Kisumu, at the western part of the country, prices also are found to directly co-move with the SAFEX white maize price. However, the tests provide moderate evidence for co-movement between the market prices in both Nairobi and Mombasa and the South African white maize price. Nevertheless, strong evidence of co-movement with the international price ensures that prices in these markets should, in practice co-move with the South African prices, but probably at very slow rates of adjustment.

Table 3 – Kenya: Price transmission

	NAIROBI	**MOMBASA**	**ELDORET**	**KISUMU**
Evidence for co-movement with:				
> International price (yellow)	Strong	Strong	Strong	Strong
> South African price (white)	Moderate	Moderate	Strong	Strong
Causality	World → domestic	World → domestic	World → domestic	World → domestic
Months to full adjustment to international price	6.2	9.1	9.1	6.2
Months to full adjustment to South African price	-	-	11.1	7.7

In the short run from one month to another, Kenyan prices are not affected by shocks in either the international or the South African price and tend to fully adjust to their relationship with the international market price relatively slowly, in approximately 6 and 9 months. Adjustment to SAFEX prices is even slower for Eldoret. However, prices of border markets, such as Kisumu, appear to adjust to both international and South African prices relatively faster than the prices in other markets. Within the country, maize markets appear to be well-integrated with each other and maize prices in Kisumu are also found to co-move with prices in Uganda.

In summary, Kenya, a large producer, consumer and net importer of maize, is found to be integrated with the international market in the long run. However, rapid international price pass-through may be hindered by the operations of the state-run National Cereals and Produce Board (NCPB), which maintains a strong influence through its involvement in the procurement of imported or domestically produced maize, and the subsequent release of food at predetermined prices. This direct government intervention, in conjunction with high import tariffs and abrupt changes in food import programs appear to weaken the relationship between the international and domestic maize prices.

3.3.3　Malawi

Malawi is an important producer of maize with a net importing trade position for most of the period 1998 - 2008. South Africa is the main source of imports, however Malawi also imports from other countries in the region. There is strong evidence that maize markets in Malawi are integrated with both the international and the South African maize markets. Prices in the country co-move with both the US yellow maize and the SAFEX white maize prices in the long run.

Short run effects between maize prices in Malawi and the international and SAFEX prices are found to be insignificant. Therefore, the relationship between domestic, international and South African prices is determined only by their long run equilibrium, while in the short run prices may drift apart due to local market conditions and policies. This suggests that domestic market conditions, and probably open market operations by the Malawian Agricultural Development and Marketing Corporation (ADMARC) determine short run price movements. With the exception of Bangula, adjustment of prices in Malawi to the international price is revealed to be slow. On average, it takes 4.7 to 7.7 months for the prices to fully adjust to a change in the international price. Prices in Bangula, an area close to the border with Mozambique, adjust to international prices within 3.8 months.

Within the country, prices of different markets co-move with each other, while in the short run, price shocks in one part of the country affect other markets, however not to

Table 4 – Malawi: Price transmission

	CHIPITA	KARONGA	RUMPHI	BANGULA
Co-movement with				
> International price (yellow)	Strong	Strong	Moderate	Strong
> South African price (white)	Strong	Strong	Strong	Strong
Causality	World → domestic	World → domestic	World → domestic	World → domestic
Months to full adjustment to international (South African) price	6.6 (5.0)	4.7 (4.8)	(8.3)	3.8 (4.7)
	SALIMA	MITUNDU	LIWONDE	MZUZU
Co-movement with				
> International price (yellow)	Weak	Strong	Strong	Strong
> South African price (white)	Strong	Strong	Strong	Strong
Causality	World → domestic	World → domestic	World → domestic	World → domestic
Months to full adjustment to international (South African) price	-(5.3)	5.8 (5.0)	7.7 (6.4)	5.5 (6.1)

Table 5 – Zambia: Price transmission

	LUSAKA	CHIPATA	KABWE	CHOMA	KASAMA	NDOLA
Co-movement with						
> International price (yellow)	Moderate	Weak	Strong	Weak	Strong	Strong
> South African price (white)	Strong	Strong	Strong	Strong	Strong	Strong
Causality	World → domestic	World → domestic	World → domestic	World → domestic	World → domestic	World → domestic
Months to full adjustment to international price	-	-	4.8	-	5.5	3.2
Months to full adjustment to South African price	7.6	8.3	5.3	6.7	7.7	3.1

a full extent. In general, full adjustment between domestic market prices takes place in approximately 4 months. In brief, Malawi's borders with countries themselves well-linked to the South African market, as well as the importance of the SAFEX futures market in the region, ensures the long run integration of Malawi's maize markets with the international and the regional markets.

3.3.4 Zambia

Zambia usually imports maize, the amount depending on the climatic conditions that determine the size of the harvest. South Africa is the main source of maize imports, while exports from the country are negligible.

Prices in all markets co-move with the South African price of white maize. Markets in Kabwe, Kasama and Ndola also appear to be integrated with the international market however, there is moderate evidence that in Lusaka, Chipata and Choma, prices follow the international market trends. Shocks in international markets are expected to slowly affect these domestic markets through their relationship with the SAFEX price of white maize.

Within the country, domestic markets are found to be well-integrated between them, indicating that transport costs and other factors do not hinder the flow of information from one part of the country to another. The extent of integration between different markets in Zambia, suggests that price shocks in one market are expected to be smoothed out quite rapidly in approximately 2 months.

3.3.5   Uganda

Price transmission analysis in Uganda was impeded by lack of data. With the exception of the data available for Kampala, short price time series, covering the period from 2001 to 2004, rendered the statistical inference difficult. Maize is not the main food in Uganda, however during the last decade maize production has been exhibiting a steady increase with the country becoming a net exporter. A large share of imports originates from the US, while Uganda traditionally exports to countries in the region, such as Kenya, Rwanda and Tanzania.

The analysis provides moderate or weak evidence that prices in the capital, Kampala, and in Kabale co-move directly with either the international or the SAFEX prices. In Mbale, a region at the border with Kenya, prices were found to co-move in the long-run with international prices. Nevertheless, maize prices at both Kampala and Mbale co-move with prices in Kenyan markets, namely Mombasa and Kisumu, in the long run.

In the short-run, international prices do not to affect maize prices in Mbale. There are, however, significant short-run effects between the prices of maize in Kampala and Kisumu. In general, the adjustment of prices in Mbale to changes in international prices was found to be relatively fast with full adjustment to international price changes taking place within 3.3 months. Prices in the Kampala and Mbale markets fully adjust to changes in the Kisumu price within a period of approximately 6 to 7 months.

Within Uganda, there is strong evidence that market prices appear to co-move with each other. The market in Kampala appears to be central, in the sense that provides price

Table 6 – Uganda: price transmission

	KAMPALA	**MBALE**	**KABALE**
Evidence for co-movement with:			
> International price (yellow)	Moderate	Strong	Weak
> South African price (white)	Moderate	Moderate	Weak
> Kenyan prices (white)	Strong	Strong	Weak
Causality	Kenya ↔ domestic	world, Kenya ↔ domestic	-
Months to full adjustment to international price	-	3.3	-
Months to full adjustment to Kenyan price	5.8	7.1	-

information to markets in both Mbale and Kabale. Prices in the latter two markets are also found to adjust rapidly to the Kampala market prices with full adjustment taking place in approximately 2.2 months. In general, maize markets are small as compared with markets elsewhere in the Eastern and Southern Africa region, and by large tend to be more exposed to changes in the prices of the traditional trade partners, such as Kenya, rather than international price shocks.

3.4 SUMMARY

Price transmission is crucial when analyzing the impact of international food price swings on developing countries. Most countries in the Eastern and Southern Africa region, where maize is the staple food, also experienced dramatic increases in the price of maize in 2007–08, in line with the international market, while subsequently domestic maize prices continued to fluctuate in spite of the fall in the international price level.

The analysis presented in this section formally tested the extent to which shocks in the international maize market pass-through to a number of countries in the Eastern and Southern Africa region. Price transmission was assessed in terms of co-movement and the time necessary for domestic prices to adjust fully to changes in the international price of maize.

The empirical evidence suggests that in the long run, with the exception of Uganda, changes in the prices of international yellow maize and South African white maize are transmitted to the Eastern and Southern African markets studied. Nevertheless, price transmission is characterized by a slow adjustment to international price changes. This signifies that most markets do not fully respond within a period of 3-4 months to international market shocks. Full adjustment to international price changes takes place, on average, at the end of a period of 5 to 8 months. Undoubtedly, such slow adjustment reflects incomplete price transmission. Although prices in the region have an underlying trend which is determined by the international market, short run fluctuations are shaped by domestic factors.

Although, in the past it has been widely accepted that consumer preferences resulted in white maize markets being insulated from the international market where yellow maize is traded, the analysis provided evidence that prices of white maize follow the trend of those of yellow maize, but slowly. This relationship may be accounted for by a degree of substitutability in consumption, the low productivity of agriculture in Africa and a maize structural deficit that arose due to the conversion of Zimbabwe from a net exporter to a net importer.

This relatively slow price transmission of international maize price changes suggests that African maize markets will continue to be characterized by volatile prices in the short run, as market forces take time to smooth domestic shocks. On the other hand, the likelihood of externally caused wide price swings in the region may also increase. As African maize prices co-move in the long run with those of the world market, international price booms and slumps are transmitted to Africa. As international grain markets became increasingly integrated with the energy market, the incidence of such shocks may increase, as discussed in the previous section. Such price swings can clearly negatively affect African countries, adding to the inherently domestic variable prices and resulting to possibly more persistent price effects.

Chapter 4
The impact of price changes on poverty and food security

At the micro-level, households react differently to price swings depending on their ability to expand the production of food, their consumption patterns, their initial asset endowment and the manner they diversify income. In addition, the constraints they face in terms of liquidity and access to markets also play a role. On average, the net position of households in the market, that is whether households are net sellers or net buyers of food, will determine the impact of price changes on income, food security and poverty.

In general, the well-being of poor urban households is expected to be significantly worsened by high food prices, especially in low income countries where food expenditure consists of a large share, often over 50 percent, of total income. Rural households, whose income depends mainly on agricultural production activities, may gain if they are able to expand production and increase the food surplus they market.

On average, a number of studies suggest that, in developing countries, the majority of the poor live in rural areas and although their income is, by and large, generated by agricultural activities, most are net buyers of food and therefore, they will be adversely affected by the food price upswing. (see for example Poulton *et al.* 2006, Christiansen and Demery, 2007). The possible benefits of any price windfall to producers may also be dissipated through the links of agriculture with other sectors of the economy. Food price rises may stimulate production and result in increases in rural employment, thus benefiting vulnerable population groups such as the landless. Such structural characteristics shape the adjustment to price swings in terms of changes in production and consumption and also determine the distribution of benefits, or burden, across the population.

This section provides a synthesis of recent evidence on the impact of price booms on households and poverty, as well as the effect of price fluctuations on household decisions and well-being. As there are no data available on how households have reacted to the recent food price increases, most of the studies have focused on simulating the impact of the price upswing by means of quantitative models based on past household survey data sets. Rural households in developing countries are often exposed to wide price variability mainly due to domestic market shocks. International price episodes, if transmitted to domestic markets, may affect households in a manner similar to domestic price swings. However, such episodes may be more persistent than those arising from domestic shocks and span over a number of marketing seasons, thus having a longer impact on households' production and consumption decisions.

4.1 THE IMPACT OF PRICE UPSWINGS AT THE HOUSEHOLD LEVEL

The increase in food prices presents a significant threat to the poor in developing countries. The impact of the food price rise on households is diverse, generating benefits for net food producers, while significantly worsening the welfare of net food consuming households. In general, urban households that are net staple food buyers will lose, as they have to pay more to maintain adequate diets. On the other hand, rural households, especially those that are involved in the production and sale of staple foods, may benefit to a certain extent. The short-run impact of the food price boom on poverty is of particular concern in low income developing countries. Undoubtedly, poor urban households constitute the most vulnerable population group. Non poor urban dwellers will also be negatively affected as non-farm wages are not likely to be adjusted to the general price increases brought about by the food price upswing. Although poor rural households are generally engaged in the production of food, they may also be negatively affected, especially if their production does

not meet their food requirements and additional food has to be purchased. Net food selling rural households will gain, however the size of the windfall will also depend on their ability to increase supply and marketed surplus. Landless rural households may also benefit, as increasing prices may stimulate supply and the demand for farm labour, thus increasing wages and/or employment.

The ability to adjust to the new market environment will also determine household welfare and the impact on poverty and food security. Substitution possibilities in consumption may offset part of the negative shock, depending on the extent of staple food diversification and relative price changes. For rural households, the extent to which production can respond to increasing prices depends on factors such as access to markets for output and inputs, access to technology and adequate capital. In developing countries, markets are often missing as poor infrastructure causes high transaction costs, and access to credit and technology is limited. Farmers are characterized by small holdings, poor technology and lack of specialization in production, all of which hinder the development of the agricultural sector. Access to inputs, such as fertilizers and seed is also limited. Input marketing chains are not well developed as private sector participation is plagued due to the small size of markets and their geographical dispersion. This, in conjunction with variable demand and high transaction costs, limit the economies of scale. The demand for fertilizer is affected by cash constraints, uncertainty and risk and, during the past two decades, by the persistent low profitability of food production in relation to cash crops. These problems in input markets are aggravated by the recent rapid upsurge in the international price of fertilizers. As fertilizer prices increased faster than food prices, expectations on lower profitability have resulted in significant reduction in the use of fertilizers, hindering supply response and affecting the livelihood of smallholders.

Sustained food price increases will have a significant impact on the extent of poverty. Small land assets and limited access to inputs due to cash constraints, as well as limited access to output markets due to distance and poor infrastructure lead to poor households being predominantly net buyers of food, having no, or insignificant marketed surplus.

4.1.1 Recent empirical evidence

A number of researchers have attempted to measure the implications of the food price upswing for poverty in developing and less developed countries (Ivanic and Martin, 2008; Polaski, 2008; Wodon *et al.* 2008; Wodon and Zaman, 2008). These analyses utilize several different methodologies and apply them to household survey data from a number of developing countries. In general, the results suggest that on average food price increases will result in increased poverty. Across countries, increases in food prices will have very diverse effects depending on the structure of the economy, the linkages of agriculture with other sectors, the households' net position towards food markets, as well as on the distribution of households around the poverty threshold. Nevertheless, in most cases, increases in poverty occur more frequently than reductions.

Ivanic and Martin (2008) estimate the impact of food price increases on poverty on a number of low income countries, utilizing a Computable General Equilibrium (CGE) model and a measure of poverty defined by the standard 2007 World Bank World Development Indicators 'dollar-a-day' expenditure. Although the direction and magnitude of the effect varies across countries, on average their findings suggest that the overall impact of higher food prices on poverty is negative for the majority of countries examined. For example, high food prices are expected to increase poverty in Nicaragua, Zambia, Pakistan and Madagascar, while poverty in Peru and Vietnam may contract to some extent due to a significant number of households which are net producers of rice. On the whole, apart from a few cases where food price increases led to a reduction of poverty in rural areas, in most cases the number of poor households in both urban and rural areas is expected to increase.

Wodon *et al.* (2008) analyse the impact of the food price upswing on a number of West and Central African countries. Their results suggest that on average, a 50 percent increase in the price of selected food items will cause an increase of between 2.5 and 4.4 percent in the share of population in poverty. This is due to the fact that a large share of food is imported, and the negative impact on food consumers outweighs the positive effect on the net sellers of locally produced goods.

Wodon and Zaman (2008) find that the impact of increasing food prices on sub-Saharan African countries is somewhat lower, with a 50 percent increase in the prices of selected foods resulting in a 3.5 percent increase in the poverty headcount. This result implies that, at an aggregate level, for all sub-Saharan Africa – a population of 800 million – the food price upturn could lead to an increase in poverty of approximately 30 million. The overall impact of higher prices becomes more significant if we consider the decrease in the well-being of the already poor households. Although the above analyses highlight clearly that many non poor households face increased food expenditure and fall below the poverty threshold, the food price upswing has a significant negative impact on households that are already poor and food insecure and deepens poverty.

Another study by Polaski (2008) focused on the effect of food price changes in India, the country with the largest number of poor in the world, where over 80 percent of the population live on less than US$2 per day. The study sheds light on another dimension of the food price upswing impact on developing countries by exploring the links between agricultural prices and the sources of income for both rural and urban poor. The analysis suggests that labour markets play a largely positive role in transmitting the price effects to the economy. A simulation of a 50 percent increase in the price of rice utilizing a CGE model suggested that food price increases would benefit most poor households, especially those that identify with vulnerable social groups and landless who supply their labour to the agricultural sector.

The findings suggest that the poorest households and the most disadvantaged groups could experience the largest gains, up to 6 percent increase in income, while only the richest 10 percent of rural households would lose from a price increase. Therefore, food price increases can lead to an increase in the demand for farm labour and increased income for rural workers, with illiterate workers and disadvantaged groups being potentially the largest gainers. Polaski (2008) also indicates that the impact on urban households can be diverse, with some poor households gaining slightly and others losing slightly. Illiterate urban workers and other vulnerable groups can experience income increases, while the results for other urban workers showed a mix of small gains and small losses with no consistent pattern.

Conforti and Sarris (2008) employ a CGE model for Tanzania and trace the effects of commodity price increases through the economy and the households. They find that the commodity price changes facing a country like Tanzania can amount to a 6 percent of GDP negative shock to the economy. The reason for this is that while the agricultural price rises may imply a positive shock, the large petroleum crises imply an even larger negative price shock, as Tanzania relies very much on petroleum imports.

4.1.2 The impact of food price increases on Eastern and Southern Africa: Evidence from econometric model simulations

Additional research carried out in the FAO Trade and Markets Division, examined the impact of an increase in food prices on consumption, household food expenditure and food security in Malawi, Zambia and Uganda. The analysis was based on a simulation of food demand system models that were estimated utilizing household survey data sets and

sheds light to the importance of staple food diversification in offsetting the negative effects of food price increases[4]. Chirwa (2009), Govereh (2009) and Sarris and Rapsomanikis (2009) also discuss these simulations.

While every effort was made in order to analyse the most recent data, the choice of the data sets was determined by their richness in terms of information on variables, such as food prices, as well as on information that would allow the determination of total and agricultural income. The demand analysis in Malawi and Zambia was based on the Integrated Living Standard Measurement Survey 2004 and the Living Conditions Monitoring Survey I 1996 respectively. For Uganda, the National Household Survey II 1996 was used. A preliminary comparison of the consumption patterns reflected by these data sets and current national average per capita consumption data from FAOSTAT suggested that consumption patterns have not changed significantly during the last decades, with the possible exception of wheat and cereals other than maize, for which consumption has increased particularly by urban households.

The household classes for each country were defined according to four factors, namely, food expenditure, location, contribution of agricultural activities in total income, land ownership and gender. In more detail, households were classified into food secure and food insecure by utilising thresholds set by the World Bank, and further divided according to whether they are located in urban and rural areas. Food insecure rural households were also presented according to land ownership, gender and the share of income from all agricultural activities. Rural food secure households were divided only according to the share of income from all agricultural activities. This approach draws attention to the extent to which household characteristics, such as income diversification and consumption preferences, result in more or less vulnerability to food price spikes.

Due to the lack of specific information on the recent trend of prices of locally produced foods, the analysis did not include a simulation of an increase in the prices of all food items. Instead, it was hypothesized that only the prices of grains and meat, food commodities that are internationally traded, increased by 50 and 20 percent respectively. However, anecdotal information suggests that the prices of locally produced foods also rose mainly due to the increase in transport costs, as well as the strengthening in demand, as consumers substituted grains for other local staples. For these reasons, these results may not accurately estimate the impact on consumption of increased food prices. A number of additional assumptions were made in order to provide estimates on changes in the level of food security. First, it was assumed that households react to food price increases only by decreasing consumption of more expensive foods and substituting one food for another. This overlooks that households can smooth consumption by utilizing savings in the form of near-liquid assets, or by increasing their supply of labour off-farm. Second, it was assumed that producing households do not respond to the price rise by increasing supply. For this reason, our results pertain only to the short run.

In general, the simulation results provide some indication of the extent of the impact of food price increases on households' food security. Nevertheless, the value of this particular

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[4] The empirical work involved the estimation of demand functions for several food items and aggregates, in a double-log specification with quantities of an item consumed being the function of the price of this item, as well as the prices of all other goods. The estimation was carried in two steps, in order to take into account the information contained by zero observations. As for a specific food item, only a subset of households consumed positive quantities, the Heckman two-step estimator was used in order to correct for selection bias. The first step involved the estimation of a probit model that was used to predict the probability of a household consuming a particular food item. In the second step, the demand equations were estimated, incorporating a transformation of the predicted individual probabilities as an additional explanatory variable.

simulation lies more on the comparisons of the impact across countries and the importance of income and staple diet diversification. In Malawi and Zambia, the annual per capita consumption of maize amounts to an average of 163 kg and 150 kg respectively. In Malawi, poor households consume significantly less maize, with the per capita consumption amounting to 135 kg (see Table 7).

The food price upswing affects households which respond by reducing the consumption of foods of which prices increased and exploiting substitution possibilities according to relative prices. For Malawi and Zambia, the simulation of a 50 percent increase in the price of maize suggests that, on average, consumers reduce the maize consumption by 8.5 and 15.6 percent respectively.

On average, poor and food insecure households reduce the consumption of maize, the main staple food, to a lesser extent as compared with non poor and food secure consumers, reflecting limited possibilities of substitution. For example in Malawi, food insecure households reduce their per capita maize consumption by 4.4 percent, as compared with an 11.8 percent reduction for the food secure households. Evidently, the consumption of

Table 7 – Impact of food price increases on consumption

MALAWI				
	Food insecure		Food secure	
	Baseline consumption kg per capita	Impact of shock on consumption, %	Baseline consumption kg per capita	Impact of shock on consumption, %
Maize	135.2	-4.4	189.3	-11.8
Other cereals	4.4	-17.2	17.2	-21.0
Cassava	68.3	-5.3	100.7	0.3
Other roots and tubers	46.4	0.1	102.5	5.1
Meat	13.5	-2.0	39.1	0.6
Fruit and vegetable	67.8	7.3	108.9	3.9
Pulses	21.5	9.2	42.7	6.7
Other foods	19.6	-4.9	55.0	-3.2
ZAMBIA				
	Food insecure		Food secure	
	Baseline consumption kg per capita	Impact of shock on consumption %	Baseline consumption kg per capita	Impact of shock on consumption %
Maize	149.5	-14.3	150.8	-17.3
Other cereals	49.7	-22.2	115.8	-21.7
Cassava	43.0	-2.2	49.4	-2.1
Other roots and tubers	33.2	-1.2	48.2	-0.3
Meat	13.8	-16.3	39.2	-17.1
Fruit and vegetable	24.9	3.3	45.7	4.0
Pulses	18.4	5.0	30.6	0.5
Other foods	26.5	2.1	59.8	0.3

other foods increases, with the extent of the changes been determined by the estimated cross-price elasticities.

The consumption of other cereals, which do not constitute staple foods in this region, was simulated to contract by approximately 20 percent in both countries. In Zambia, the hypothetical increase of 20 percent in the price of meat is expected to result in a 16.6 percent reduction in its consumption, as the demand of meat is characterized by a relatively high own-price elasticity. In Malawi, the decrease in meat consumption was simulated to be significantly less pronounced.

In both countries, the decrease in the consumption of maize and other cereals does not offset the impact on the price rise on food expenditure. In Zambia, where households allocate about 20 percent of their food budget to maize, food price rises result in total food expenditure increasing by 8 percent. In Malawi, where maize consists of a high share of approximately 33 percent of total food expenditure, households' total food expenditure increases by nearly 10 percent in spite of the contraction in the consumption of maize. Limited possibilities for substitution in consumption and, especially the high share of maize consumed in total expenditure result in significant increases in the amount of money spent for food in vulnerable household categories, such as food insecure families headed by females. In Malawi, where about 43 percent of expenditure by poor female headed households is allocated to maize, food price rises result in significant increases in money spent for food (Figure 8).

High food prices and the corresponding increases in food expenditure result in increases in the rate of food insecurity, as households experience a decrease in their purchasing power (see Figure 9). In Zambia, food prices rises result in a 5.4 percent increase in the number of food insecure. The corresponding increase in the number of food insecure in Malawi is significantly larger and amounts to nearly 13 percent. Depending on consumption patterns and the distribution of households around the food security threshold in each country, the food price surge can result in significant increases in the number of vulnerable households. For example, in Malawi, the simulation indicates that the number of urban food insecure households can increase by 19 percent, and the number of smallholder food

Figure 8 – Simulated impact of food price rise on total food expenditure (% changes from baseline)
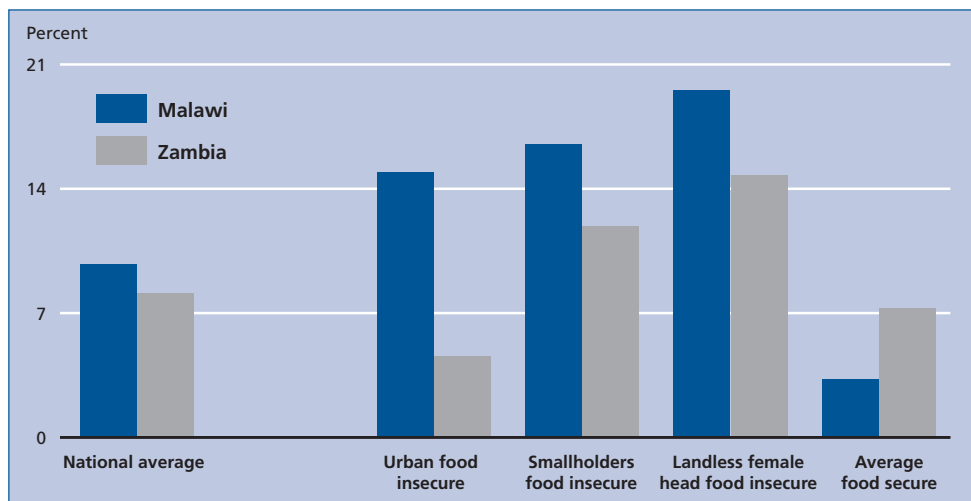
Figure 9 – Impact of food price increases on food insecurity
(% changes from baseline)
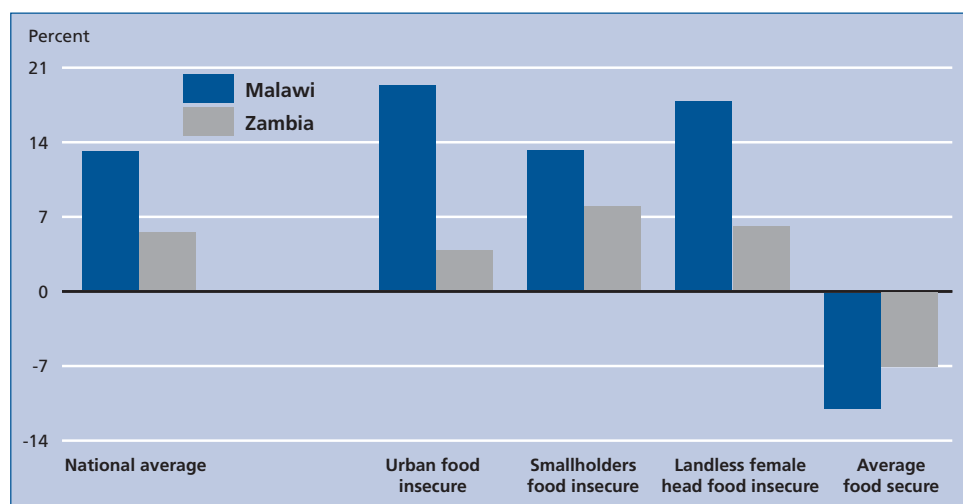
insecure families by 13 percent. Although the majority of producers in these countries are net food buyers, these results reflect the maximum impact of food price increases, as the possible positive effect on production, or the increase in the value of food stocks held by the household are not taken under consideration.

In addition, such a simulation exercise does not reveal the overall impact of higher food prices. This becomes more significant if the decrease in the well-being of the already poor households is considered. Although the above analyses highlight clearly that many non poor households face increased food expenditure and fall below the poverty threshold, the food price upswing has a significant negative impact on households that are already poor and food insecure and deepens poverty.

Comparisons of the impact of the food price increase across countries highlight the importance of staple diet diversification in maintaining food security during food price episodes. The role of diet diversification in offsetting part of the high food price impact was assessed by conducting a separate simulation of a 50 percent increase in the price of maize only in Zambia, Malawi and Uganda.

In Uganda, maize consumption amounts to an average of 29 kg per capita, a quantity significantly lower than that consumed in both Malawi and Zambia. Maize's share in total food expenditure amounts to about 8 percent. In addition to maize, Ugandan households consume a variety of staple foods, such as rice, millet, matooke and cassava. Both matooke and cassava are important staples, which are produced domestically and consist to about 20 percent of total household food expenditure. Although prices of rice and millet also rose, the prices of matooke and cassava, foods that are not internationally traded, exhibited weaker increases of about 35 and 20 percent respectively, as compared to an increase of 75 percent in the price of maize (Benson, Mugarura and Wanda, 2008).

Table 8 presents the results of the impact of a 50 percent increase in the price of maize on Zambia, Malawi and Uganda. For Uganda the simulation suggests that as maize prices increase, its consumption decreases sharply by approximately 30 percent. Both food secure and insecure households exhibit similar response to the increase in the price. Total food expenditure rises

Table 8 – Simulated impact of a 50 percent increase in the price of maize in Malawi, Zambia and Uganda

		POOR HOUSEHOLDS	NON POOR HOUSEHOLDS
MALAWI	Quantity of maize consumed, kg per capita	135	189
	Actual expenditure share of maize, %	41.5	25.2
	Quantity of maize consumed, % change	-4.79	-11.78
	Expenditure share of maize, % change	16.13	12.84
	Total food expenditure, % change	15.69	4.63
	Number of households, % change	13.01	-10.47
ZAMBIA	Quantity of maize consumed, kg per capita	150	151
	Actual expenditure share of maize, %	21	15
	Quantity of maize consumed, % change	-15.52	-18.85
	Expenditure share of maize, % change	15.61	9.51
	Total food expenditure, % change	3.11	2.63
	Number of households, % change	4.34	-5.61
UGANDA	Quantity of maize consumed, kg per capita	15	35
	Actual expenditure share of maize, %	8	8
	Quantity of maize consumed, % change	-30.03	-29.60
	Expenditure share of maize, % change	2.90	2.51
	Total food expenditure, % change	0.94	0.07
	Number of households, % change	0.76	-0.33

by a very small proportion, leading to less than one percent increase in the number of food insecure households in Uganda, as compared to an increase of 13 percent in Malawi. An additional simulation of a wider increase in food prices in Uganda, including increases in the prices of other cereals and matooke by 20 percent, results in an increase of 2.5 percent in the number of poor households. These findings suggest that the range of domestically produced staples in conjunction with the relatively large quantities consumed, moderate the negative impact of the international maize price upturn on Ugandan households.

4.2 FOOD PRICE SWINGS AND VOLATILITY

If transmitted to the domestic markets of developing and less developed countries, the sharp decrease in food prices, after their peak in July 2008, is expected to provide significant relief to food net buyers, the poor and the vulnerable even though prices remain relatively high compared with few years ago. Nevertheless, the boom and the slump of food prices may result in a cycle of investment and divestment in agriculture that may hinder the growth of the sector. Low prices may result in net producing rural households divesting in their production capacity, selling assets, such as animals, thus jeopardizing future income streams from staple food production and increasing the risk of chronic poverty.

Food price variability has a significant impact on rural households' well-being, as agricultural commodities form the basis for household income and food consumption in developing countries. Price uncertainty leads to unstable rural household income which,

especially in the presence of liquidity constraints and inadequate assets, can give rise to poverty traps and economic inequality within rural populations. Rural households in developing countries are normally exposed to wide price fluctuations, mainly from domestic factors such as weather. Nevertheless, international market price booms and slumps may be relatively more persistent and encompass a number of agricultural commodities, thus leading to more significant effects.

Households minimise their exposure to risk from price shocks by developing risk management strategies such as crop and income diversification, obtaining off-farm employment and developing self-insurance by smoothing consumption. However, the diversification of activities inhibits efficiency gains from specialization in production and hinders the development of the agricultural sector. Income risks may also blunt the adoption of technologies necessary for agricultural production efficiency, as producers may decide to apply less productive technologies in exchange for greater stability.

Consumption smoothing is a household self insurance mechanism that involves building precautionary savings in the form of liquid or near liquid assets in good years, for depletion during years of adverse covariate shocks. There is conflicting evidence on whether such strategies are effective in smoothing consumption, especially when the increases in food prices are sustained (Dercon, 2005; Kazianga and Udry, 2006). The current consensus appears to be that, in spite of the variety of smoothing strategies adopted by poor households, there is substantial residual consumption risk. In addition, consumption smoothing hinders production choices, as well as investment in productive assets. This reduces the ability of households to cope with future income shocks.

Evidence on the behaviour of agricultural commodity producing households during price booms and slumps is sparse. Okello (2009), based on a survey of smallholder households in seven districts of Kenya conducted in November and December 2008, analysed their response to high food prices. Approximately 38 percent of the households interviewed experienced a food deficit and resorted to various coping strategies, including the sale of livestock and livestock products, the provision of farm and non-farm employment, reduction in the purchases of agricultural inputs, disinvestment in human capital, as well as reduced expenses on health care.

Although seeking employment opportunities, especially in other farms in the village or region, has in the past been a usual response to food deficits in Kenya, in 2008 poor rains resulted in reduced agricultural activity, rendering the supply of labour ineffective as a strategy to hedge against the ensuing risk of food insecurity. Weak demand for labour in conjunction with high fertilizer prices prompted smallholders to purchase low quantities of fertilizers and to consume a part of the seed, initially saved for the next planting season. Delays in the payment of school fees and reduction in health care were also found to consist of frequent responses, suggesting that price upswings can result in disinvestment in human capital.

Ha and Shively (2008) examined the impact of the coffee price swing on households in Vietnam and suggest that the upturn and the subsequent collapse of coffee prices in 1999 had important effects throughout the country. They stress that the price swing reversed the fortunes of many smallholders, as for most, low coffee prices were insufficient to cover the variable costs of production for three consecutive years. The authors observed a number of specific patterns of behaviour including reductions in the use of inputs, changes in the allocation of land and cash enhancement.

The most common response by Vietnamese households to the coffee price downswing was a reduction in the use of fertilizer, regardless of the farm size, reflecting the necessity to reduce expenditure and shift resources out of coffee. The reduction in the use of inputs was

found to be more pronounced in large farms, rather than small farms, as large farms were likely to be more diversified in terms of production without relying exclusively on a single cash crop. Cash enhancement, through off-farm labour, the sale of assets and borrowing from both formal and informal sources was found to be an alternative manner of managing the impact of the price fall. Ha and Shively (2008) suggest that smallholders are more likely to seek off-farm employment, or to sell livestock in order to raise the necessary cash.

In their analysis of the impact of the 1995–99 coffee price swing in Uganda, Bussolo et al. (2007) provide evidence for consumption smoothing through building assets, mainly in the form of cattle, during the price boom, and asset depletion during the price slump, especially by households who grew coffee on more that 60 percent of their cultivated land. Nevertheless, coping mechanisms to manage price downswings, such as the reduction of productive assets, lead to a predisposition for small households to fall into chronic poverty. These findings suggest that in the case of a general food price downswing, larger farmers may divest in agriculture through drastic input reductions that may result in a reduction in food marketed surplus. On the other hand, small farming households, which are typically net buyers, may seek off-farm employment, or may resort to selling their assets in order to gain cash.

4.3 SUMMARY

Food price surges may have diverse effects on the well-being of households. Urban families, which, on average, rely on the market for food purchases, experience significant increases in the cost of food. Rural households may gain if they are able to expand production and increase the food surplus they market. Nevertheless, in developing countries the majority of the poor live in rural areas and although their income is, on average, generated by agricultural activities, most are net buyers of food and therefore, negatively affected by price upswings.

In this section a synthesis of recent evidence on the impact of price swings on households and food security was presented. Most of the analysis has been conducted by means of economic models, either general equilibrium or econometric, and should be thought of as providing an indication to the direction and magnitude of the effect on households. In general, food price rises are expected to significantly worsen household welfare. Especially in low income countries where a large share, over 50 percent, of total income is allocated to the purchase of food, food price increases will increase the number of poor and food insecure.

The ability of rural households to adjust to the new market conditions either by exploiting substitution possibilities in consumption, or by expanding production will determine the impact of food price rises at the micro-level, as well as the distribution of benefits and costs. Households that have diversified diets or are able to adjust their consumption by substituting staples of which the price increases with cheaper foods are able to offset part of the negative impact of the food price boom.

For example, the model simulations presented in this section suggest that diet diversification is important. In Malawi, where maize consists up to 40 percent of total food expenditure, increasing food prices may result to significant increases in the number of food insecure. In Uganda, staple diet diversification and the relatively large quantities consumed of local foods, moderate the negative impact of the international price boom. Adjustments to consumption patterns, however, may not suffice to shield the poor and the vulnerable and policies are necessary to safeguard food security at the household level, targeting the poorer population groups and enhancing their purchasing power.

The extent to which rural households respond to increasing prices by expanding production depends on many factors. Poor access to markets for output, inputs and credit, poorly defined property rights, lack of efficient technologies and inadequate capital, all present constraints to production. In developing countries, markets are often missing as poor infrastructure causes high transaction costs and farmers are characterized by small holdings and poor technology which hinder the development of the agricultural sector. It is likely that many smallholders will not be capable of increasing production effectively in the short to medium run. Access to markets is crucial and the problem calls for a range of policies which should aim at supporting inputs, such as fertilizers and seed.

Although price downswings benefit consumers, the boom and the slump of food prices may result in a cycle of investment and divestment in agriculture. Low prices, in a parallel manner with high prices, may result in poor rural households divesting in their production capacity, selling assets, such as animals, thus jeopardizing future income streams and increasing the risk of chronic poverty. Improvements in infrastructure; market-smart input subsidies, especially when the price of fertilizers recent rapid surges, enhanced extension and financial services consist of policy options that can assist producers in price booms and slumps and prevent divestment in capital and productive inputs.

Chapter 5
Policies for managing food price swings at the market level

Many developing countries have reacted to the food price upswing through a spectrum of policies at the market level. Several food importing countries have reduced or suspended their import restrictions, while many exporting countries have limited, or even banned, exports in order to avoid food shortages and higher domestic prices. Tax reductions on food were also implemented. A number of countries have chosen to intervene directly in the market by managing food reserves, releasing stocks and initiating import programs in order to stabilize domestic prices (see Figure 10).

Market policies attempt to reduce the cost of food, and increase its availability. This section discusses such policy options and examines their implementation, drawing a number of lessons from the recent experiences in Africa during the 2007–2008 food price episode. The key distinguishing feature of most of these policies is that they alter market conditions, most notably the prices of food and thus, affect all households. Market policies, if effective, lower food prices for both poor and non poor. Nevertheless, as the institutional and policy implementation system is already in place in most of African countries, such interventions can be easily conducted.

Governments in Eastern and Southern Africa actively intervene in the food markets utilizing both trade and tax policy instruments, as well as conducting direct market operations. The latter has given rise to contentious debates, since the initiation of agricultural market reform in the 1980s. The analysis of the recent food price boom and slump adds to this debate by focusing on examples of direct market operations in the region.

The section highlights two important features of government intervention in Eastern and Southern Africa. First, it stresses the preference of governments to pursue trade policies and open market operations with the objective of smoothing regular food price seasonality and other price shocks. Second, it emphasizes the governments' tendency to intervene in weak markets and without consideration of the negative consequences on traditional trading partners and the private sector.

Many governments in the region directly intervene in the market through parastatal marketing boards. The underlying risk of such operations can be significant. Trade policies,

Figure 10 – Food market policies implemented by African countries
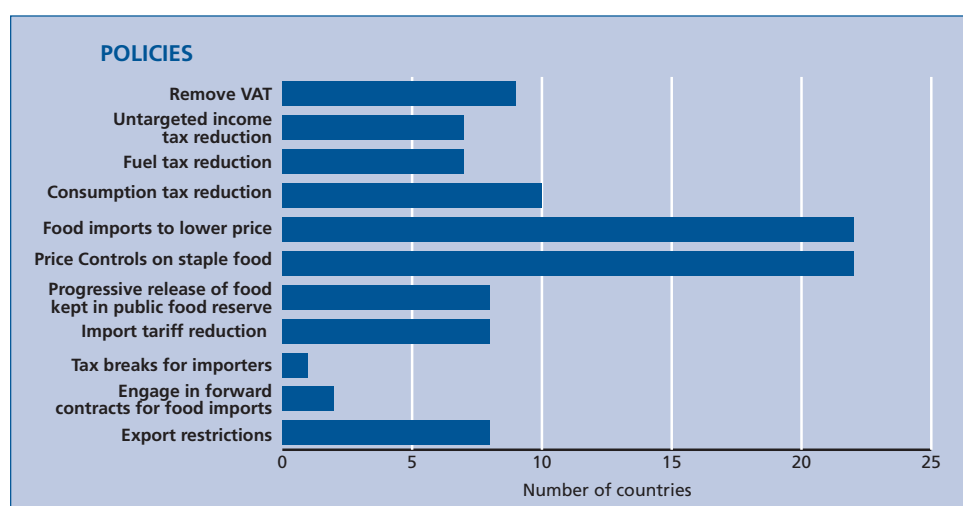
Source: Demeke Pangrazio, & Maetz (2009)

buffer stock management, import programs, domestic food procurement and other pricing policies are typically implemented in fragile markets that are characterized by high transaction costs, high price variability, vulnerable smallholders and a dual marketing system comprising the public and the private sector. The imposition of export bans during the recent food price boom has had negative consequences for importing countries in the region that were unable to secure food in order to rein in price increases. Errors in market management and unintended policy effects during periods of sustained international price increases can lead to dramatic price spikes in the domestic markets, significantly harming the vulnerable and the poor.

Direct government intervention in the market also 'crowds out' the private sector, incurring costs in both the short and the long run. Although it is acknowledged that governments retain the right to ensure the availability of low priced food, abrupt changes in policies increase price uncertainty for the private sector and act as a deterrent to the development of food marketing systems. This section also provides a number of recommendations on direct market management, contributing to the policy dialogue.

5.1 TRADE AND TAX POLICIES

Trade policies consist of restrictions on food imports or exports through taxation, quotas or bans. They result in a change in the relative prices of traded goods in the economy and affect all households. As the effect of price changes is determined by the households' consumption patterns, income level and diversification, trade policies have also distributional implications and unintended effects that targeted micro-level policies can avoid. Nevertheless, trade policy instruments, such as import tariffs or export taxes, can be scaled up or down in order to manage the price swing in a counter-cyclical manner if consistent with international price commitments. For food importing countries, the temporary reduction in tariffs may result in offsetting increases in international prices, while tariffs can return to their former level when international prices fall.

In the context of the food price upswing, both import tariff reductions, as well as export restrictions have been applied by many countries (see Figure 10 for the number of countries implementing tariff reductions and export bans in Africa). In general, the reduction or the elimination of import tariffs on food products has been a widespread policy response for net food importing countries all over the world. As world prices increased, many countries lowered applied tariffs initially, and eventually eliminated them in an attempt to stabilize the domestic food price level.

On average, the reduction in import tariffs did not suffice to effectively stabilize domestic prices as international prices soared. The effectiveness of tariff reductions is determined by the initial level of applied tariffs. As international prices exhibited large increases, only the reduction or elimination of very high tariffs could result in stabilizing domestic prices. Nevertheless, available tariff data suggests that the majority of the developing countries did not initially have sufficiently high applied tariffs. For example, for a sample of 60 low income food deficit countries surveyed by Sharma and Konandreas (2008), applied tariffs on cereals and key vegetable oils were already fairly low in 2006 (within the range of 8 and 14 percent respectively). Tariffs were much lower than these averages for a majority of these countries, suggesting that these applied rates, when reduced to zero, were adequate for offsetting only a small part of the overall rise in the international prices which were higher by at least 50 percent in 2008 as compared with the 2006 level.

Import tariffs can easily be scaled-up or down to manage the price swing. Nevertheless, abrupt reductions could negatively affect the operations of private traders who may

experience decreases in the value of their stocks, as cheaper imports become available. Therefore, greater consultation between government and the private sector is necessary to minimize the negative effects.

Many developing countries have implemented some form of export restrictions in an attempt to ensure domestic food security. In the context of food price booms, such a choice aims at maintaining domestic food prices at a relatively low level in order to protect consumers. For exporting countries, when world prices increase, export restrictions are motivated by the argument that farmers may not allocate the increase in their income in a partly efficient manner. Export taxation allocates the windfall in the public sector, where economic mismanagement and investment choices that are not well targeted can result in no significant positive growth (Deaton and Miller 1995). This argument is also supported by the literature on natural resources' price increases, which stresses that the public sector often has poor forward linkages through investment.

According to the World Trade Organization (WTO) rules for export, taxes are allowed while export prohibitions are disciplined. Nevertheless, such rules are weak and essentially not binding, as high export taxes can effectively block exports. In the past, many African countries managed cash crop price increases by introducing export taxation, such as the taxation of coffee exports in Uganda during the coffee price boom of 1999 (Chant, McDonald, & Verschoor, 2008). During the recent boom, in an attempt to maintain food prices at low levels, a number of countries, including Kenya, Tanzania, Malawi and Zambia, imposed export bans. However, although export restrictions lower domestic prices and thus are seen as supporting consumers, their effectiveness is undermined due to informal trade which is common in the Eastern and Southern African regions[5].

While export restrictions may lower domestic food prices, at the same time they imply a tax on producers which lowers the incentive to respond to the international price increase. If protracted beyond the immediate price surge, export restrictions may discourage investment on agriculture in exporting countries and have negative implications for food security. In the short run, widespread implementation of export restrictions renders the international market less reliable as a source of food, exacerbates international price instability and harms consumers in other countries which can lead to import-substitution and inefficient allocation of resources. For example, in the autumn of 2008, the imposition of export bans by a number of Eastern African countries limited the Kenyan government's options in curbing the price upswing.

Jayne, et al. (2008b) stress that export bans hindered the effective relief of maize deficits in a number of areas in the region. Although in general bans do not stop trade, they increase the transaction costs and thus, inflate consumer prices, while lowering the prices received by producers, compared with what they would otherwise have been.

Other policies that aim to reduce the cost of food imports include tax breaks for importers and value added tax (VAT) reductions. Like reductions in import tariffs, tax breaks curb price increases. The importation of food can also be facilitated through loan guarantees or subsidized interest rates for traders. These policy instruments are especially appropriate in less developed and net food importing developing countries where credit ceilings for imports are often applied by financing institutions. Such ceilings result in traders being forced to obtain adequate financing to import sufficient volumes of food. Additional finance for commercial food imports in excess of the amount that is determined by the traders' liquidity

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[5] See for example Regional Agricultural Trade Intelligence Network (2008).

and normal credit line ceilings may be necessary in order increase domestic food availability. These policy options work with the market and thus require close cooperation between the government and the private sector in terms of estimating the amount of food that meets the country's requirements and the corresponding food import bill, as well as the amount that cannot be met due to finance constraints.

Many countries initiated cuts in taxes in a number of food products. Such reductions offset part of the increase in food prices and provided some relief to poorer consumers who spent a large share of their income on food. In addition to tariffs, taxes can also be used in order to manage the price swing in a counter-cyclical manner. In developing countries where a VAT system is in place, a number of governments applied different VAT rates to food items.

Such tax related policies are effective in lowering food prices only if the food retail sector is competitive. Oligopolistic retailers may exercise their power over the market and increase their price margins, thus hindering the passing-through of tax reduction to the consumers. Therefore, it is important that a competition authority is present for monitoring retail food prices and for regulating and enforcing competition and consumer protection laws. Effectiveness will also depend on the extend to which VAT is actually applied to retail sales, as many consumers may not buy their food in formal retail shops, such as supermarkets. Although, as in the case of import tariff reductions, tax reductions will benefit both poor and non-poor consumer, a degree of targeting could be achieved if taxes are reduced selectively on foods that are consumed primarily by poor households, such as broken grain cereals.

Finally, import tariff and tax reductions will bring about a reduction in government revenue. The fiscal cost may exacerbate the impact of the price boom on budget deficit, especially for food importing countries and needs to be measured against the benefits and compared to alternative policy options and public expenditures. In sub-Saharan Africa, the fiscal costs associated with tariff and tax reductions on food and energy doubled between 2007 and 2008 averaging to approximately one percent of the GDP in 2008. As commodity prices began to fall, a number of countries phased out these measures, while others have not yet announced their intention to bring tariffs and taxes to their previous levels (IMF, 2009).

5.2 MARKET MANAGEMENT POLICIES

Market management policies include measures such as the importation of food into public stocks managed by national marketing boards and its progressive release with a view to reducing market prices. Managing the market can also be realized by price controls through administrative orders, anti-hoarding measures such as restrictions on private trading and stockholding, as well as restrictions on inter-regional movement of foods. Such policies aim to directly manage domestic markets in order to ensure adequate food supplies at low or pre-determined prices.

Prior to the 1990s, the presence of national marketing boards which coordinated open market operations in both food and input markets was a central characteristic of many developing countries' policies towards agricultural development and self-sufficiency. Such open market operations involved either direct or indirect subsidies, as in many cases, food producer prices were guaranteed above export parity, while governments subsidized consumer prices by releasing food quantities at relatively low price levels.

Most of these practices have been discontinued mainly due to their high costs, as well as for not being market-friendly and conducive to private sector development. For example,

pan-territorial pricing of grains although it increased the share of produce delivered by smallholders to the marketing boards resulted in significantly increased fiscal expenditures due to the high transaction costs (Poulton, et al., 2006). State marketing channels incurred large operational losses, which were covered by governments or aid donors. Given the significantly high costs associated with open market operations and the negative impact on the private sector, developing countries, since the 1990s, have tended to rely more on trade for price stabilization and less on stock operations.

Nevertheless, marketing board operations are still a central characteristic in the Eastern and Southern African regions[6]. A number of countries in the region implement price stabilization policies through marketing boards. In Kenya, the National Cereals and Produce Board (NCPB) is involved in imports, procurement of domestically produced maize and inventory management. In Malawi and Zambia, the Agricultural Development and Marketing Corporation (ADMARC) and the Food Reserve Agency (FRA) respectively maintain a strong presence in the market.

5.2.1 Marketing boards and the 2007–2008 food price swing

The 2007–2008 food price swing has led several governments to rely primarily on marketing board operations in order to curb rises in domestic food prices. Food import programs and domestic purchases at market prices for public reserves and the subsequent release of stocks, often at lower prices, have been typical operations carried out by marketing boards. Together with trade measures, these operations aimed to ensure the availability of food at affordable prices. In an environment of rapidly rising world prices, marketing boards attempt to lower the domestic price of food, essentially limiting the transmission of higher international prices to the domestic markets.

The cost of such a policy may be significant. These practices tend to be successful only in the very short run, as costs escalate in line with increases in the international market prices, rendering such policies unsustainable in the medium to long run. Errors in the management of the market can also result in considerable additional costs especially when the price shock persists. In general, the success of such costly operations depends on the government's capacity and budget to mobilize imports and proceed to sales of food staples at pre-determined price levels, while informal trade across the region often reduces the policy's effectiveness.

In addition to their high financing requirements, marketing board operations can also have unintended negative effects on domestic markets. In periods of food deficit, interventions may lead to food prices surging even above import parity levels. Often, in Eastern and Southern African countries, the negative impact of intervention on food markets is the result of abrupt and unpredictable government decisions (Abbink, Jayne, & Moller, 2008). As a response to food shortages, and depending on the international market conditions, governments frequently impose abrupt import or export bans, adjust their import tariffs, or decide to import large quantities of food through the marketing boards.

Such discrete and largely unexpected policy responses increase uncertainty and weaken the incentive for the private sector to engage in trade. For example, uncertainty over domestic prices makes stockholding very risky. As marketing boards are the single most important player in the market, their power over maize prices affects the behaviour of other market participants. Especially when there are expectations for a poor harvest – a

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[6] See Jayne et al. (2002) for a detailed review of marketing policies in the region and a chronology of policy reform.

period when imports are most needed – private traders are initially unwilling to import, as governments often respond to food deficits by lowering import tariffs. Early food importers will incur costs, as when tariffs are lowered, competing traders or marketing boards will be able to import at lower prices.

Even if the government allows the private sector to import a proportion of the food requirements in parallel with the marketing board, traders are hesitant. Governments often subsidize consumers by releasing food from public reserves at prices lower than those prevailing in the market. This practice may lead to a reduction in market prices, as significant quantities of food are made available at low prices. The uncertainty over governments' decisions on the quantity and the price at which food will be released results in 'crowding out' the private sector.

The main weakness of such a dual marketing system is the lack of trust and coordination between the public and the private sectors. This mistrust hinders the development of an efficient food marketing system, and often results in much lower levels of imports leading to food shortages and subsequent price spikes and food insecurity.

Temporary food shortages caused by poor coordination may lead to dramatic domestic price increases towards, or even about the already high import parity level, exacerbating the suffering of the poor and the vulnerable. For example, in Zambia, in October 2008, the government instructed the state marketing board to import maize, while at the same time import licenses were issued to private traders in order to import additional quantities to meet the county's food requirements. But the government at that time maintained that they were not in a position to provide assurances to the private sector that public stocks would be released at market prices, reserving the right to influence the market if the maize price level were very high. Consequently, the private sector reacted with caution and no quantities were imported (Govereh, 2009). Due to the resulting maize shortages, domestic maize prices increased towards import parity levels.

Although the latter unintended effect can be thought of as a short run phenomenon, the effect of distrust between the government and the private sector may have long run negative implications for the country. The uncertainty on the expected return of commercial activities and private storage may be detrimental to food security as it acts as a deterrent to the development of food marketing systems.

In an environment of surging food prices, the behaviour of market participants, such as farmers, millers and traders, will be largely determined by their expectations of the future price level. Often, expectations of price increases trigger hoarding, as farmers and traders respond by holding on to their stocks, which further fuels the price level. Marketing boards will have to consider the reaction of market participants and implement operations accordingly.

Okello (2009) discusses a case where marketing board operations had no effect on the price level. In 2008, NCPB in Kenya failed to import sufficient quantities of maize mainly due to export bans implemented by the country's traditional trade partners in the region. In October and November 2008, in an effort to arrest the increase in retail prices, NCPB stocks were released to millers, at prices lower than those prevailing at the market. Attempts to purchase additional quantities of maize from the domestic market were unsuccessful, as farmers held on their stocks. With no other possibility for securing sufficient quantities of maize, the policy led to low volumes of food being handled by the board and had little effect on offsetting price increases.

Competition between marketing board and traders may also result in higher prices. In Malawi, based on estimates of surplus production in May 2008, the government requested

that the ADMARC accumulate food security stocks by initiating purchases in the domestic market. Within an environment of rising international maize prices, ADMARC progressively increased its price in order to outbid private traders and secure the requested quantities. Competition for maize between traders and the board was probably the cause of the domestic price increasing to historically high levels (Chirwa, 2009). As the food security targets were not met, the government banned large-scale trade and the marketing board became the only legal trader of large quantities of maize in the country. Small-scale trade was allowed at a maximum price which, however, was lower than the market prevailing price, thus resulting in farmers and traders holding on to their stocks.

In general, the presence and trading activities of both marketing boards and private firms give rise to a dual marketing system that often increases the fragility of the market (Jayne, Zulu & Nijhoff, 2006). More importantly, the recent food price episode highlights the need to reconsider the role of government in market management.

5.2.2 Marketing boards: Reassessing the policy
The experience of the food price upswing provides an opportunity for food importing countries to reassess the relative reliance on trade and stocks, taking into account the role of the private sector. Stocks may be viewed as an integral part of policies towards food security especially during price booms and slumps, when the imposition of export bans by others may significantly limit possibilities for imports. Nevertheless, carrying large food reserves is costly and, often, economically inefficient and a balance is required between trade and stocks as a means of smoothing prices and consumption during domestic or external shocks (Makki, Tweeten & Miranda, 2001).

A number of policy options for effective management of the market which consider the role of the private sector in ensuring food availability have already been discussed in the context of crop failures (Poulton, et al. 2006; Jayne, Zulu & Nijhoff, 2006). These include greater consultation and coordination with traders, transparency and predictability in government intervention according to pre-determined modalities and rules (e.g. price bands), strategic food or financial reserves and warehouse receipts.

Nevertheless, maintaining market prices at a certain level in an environment of sustained price increases in the world market is costly. Such costs may also be higher than those of marketing board operations during crop failures within a stable world market environment. Therefore, governments may have to intervene to offset part of the increase in order to protect vulnerable population groups, and more importantly, to avoid exacerbating the price increases.

The government's role in managing food markets in Eastern and Southern Africa has been extensively debated. Although arguments for full liberalization on the grounds of efficiency may be justified, governments in the region may well play an important role, as inter-seasonal storage is both expensive and risky. High storage costs and high price volatility due to elevated transport costs may discourage sufficient private inter-seasonal storage and necessitate government intervention.

The experience of the recent price episode highlights the need for effective coordination between the public and the private sector. Better synergy can smooth food supplies and avoid temporary shortages that, during an international food price upswing, can lead to dramatic price spikes. Increased cooperation between the public and the private sectors in marketing would require greater consultation, as well as transparency in the governments' intentions about import programs, trade policy instruments and other market operations.

Better coordination can be achieved through the creation of a forum for regular consultation, the provision of information and the assessment of the market situation. Furthermore, coordination could improve if governments provided credible information on their intentions regarding import tariffs and import programs, as well as details on marketing boards' plans for food quantities that will be purchased and sold.

Participatory and well-timed decisions and intervention will not only help guarantee the availability of staple food in the market, but will also help traders to remain profitable by adjusting their purchases and stocks according to more reliable information. Improved coordination will promote the sustainability of the private marketing system, while at the same time preserving the role of government in safeguarding the availability of food.

Ideally, a set of clearly defined and transparent rules, such as price bands (consumer price ceilings for triggering government intervention), are necessary. For example, the set-up of price bands provides clear indications to the private sector that the government will intervene when prices move below, or above, the pre-determined floor and ceiling. Nevertheless, price ceilings have easily become the centre of political debate. Moreover, in an environment of increasing prices, ceilings are difficult to defend and therefore, targeting a certain price level may not be practical. Instead, the government and the private sector may pursue a target in terms of staple food quantity, based on the assessment of supply and demand.

In the event of price spikes, such strategic food reserves can be utilized to provide inter-seasonal storage and offset price increases until imports arrive, or to provide subsidized food to vulnerable population groups. Their gradual release during periods of sustained price increases, together with credible information on the country's import program can also help to discourage farmers and traders from holding on to their stocks. The general release of public stocks at prices lower than those prevailing in the market should be carefully assessed. As indicated above, such practices erode the value of private stocks and undermine the functioning of the private marketing system. Instead, targeting the poor should be considered as an option. Subsidized food sales combined with social safety nets could effectively target vulnerable population groups without distorting the market.

There are a number of ways to achieve a targeted release of public stocks at subsidized prices. For example, the release of subsidized grain in areas with a very high proportion of poor targets the vulnerable in a relatively effective and inexpensive manner. Likewise, the subsidized grain distribution program could release only 'self-targeting' foods, or foods that are consumed mainly by the poor[7].

The quantity of grain to be handled by the government is also of crucial importance. Given effective coordination of the public and private sectors, policy makers may also explore the possibility of maintaining relatively small strategic food reserves, instead of attempting to directly manage the market through larger inventories. One argument for the government to handle smaller quantities of staple foods is that it encourages the private sector to develop. The size of strategic food reserves can be determined by a number of factors, such as the integration of the country with the world market in terms of trade, the level of production uncertainty and comparisons of the costs of carrying over stocks with those of import programmes.

In a way, strategic reserves can assist in balancing government intervention and private sector competition. Again, their management ought to be shaped by clear and widely

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[7] See section 6 for more details on targeted release of food reserves during the recent price upswing.

accepted rules. Some policy experts call for 'an arm's length food reserve', with autonomy like the one enjoyed by a central bank, and well-defined objectives. Byerlee, Jayne and Myers (2006) suggest that an institution with the following characteristics would minimize problems in direct market intervention:

- central bank autonomy, independent from the political process;
- clear and well-defined rules to trigger intervention;
- analytical capacity and good information system; and,
- flexibility to hold a combination of food and financial reserves in order to minimize costs.

Government decisions on how much to import are plagued by lack of information on the amount of private stocks. More reliable data on private stockholding could be collected through a warehouse receipts system, where farmers can deposit amounts of staple food of a stated quantity and quality in a warehouse and obtain evidence of ownership. This could ensure that appropriate action is taken when there is a need (Coulter and Onumah, 2002).

As the warehouse receipts system does not require farmers to surrender their produce, the receipts can be used as collateral to obtain credit, thus enhancing smallholders' liquidity and smoothing consumption. Within the context of sustained price increases, the system provides strong incentives to farmers to hold on to their deposited produce if they expect that prices will continue to rise. On the one hand, this provides an opportunity for smallholders to maximize the windfall from the price boom. On the other hand, it exerts further pressure on the prices to increase.

If farmers secure additional credit using the increasing value of the warehouse deposit as collateral, they would be able to hold on to their stocks. Such a collateralization of the price upswing may lead to a spiral of further rises in food prices and in increased credit. Nevertheless, smallholders, collectively, may not be able to hold onto their food commodities for long. First, most of the food-producing households face strict liquidity constraints and this means that for many, hoarding may not be an option, as they need cash. Second, both banks and informal lenders may perceive the collateralized warehouse receipt as risky and they may ration credit, as a fall in prices will result in a high default rate.

On the whole, although a warehouse receipts system could well provide more accurate information to the government on private food stocks and assist farmers in securing the price windfall, there is a small likelihood that it may lead to price spikes due to hoarding.

5.3 SUMMARY

Trade policies and direct market intervention have been popular measures to manage the recent price swing in Eastern and Southern Africa. The evidence suggests that, in general, governments have not been successful in curbing domestic food price surges through market measures, mostly because of the dramatic price increases experienced in the international and domestic markets, as well as due to lack of information and weak control mechanisms.

Reductions in import tariffs were not effective in stabilizing the domestic price level. On average, applied tariff rates are relatively low and therefore sufficed to offset only part of the international price increases in 2008. In an attempt to maintain food prices at low levels, a number of countries, including Kenya, Tanzania, Malawi and Zambia, imposed export

bans. Although export restrictions lower domestic prices and thus are seen as supporting consumers, their effectiveness is undermined by informal trade, which is common in the Eastern and Southern African regions. If effective, the likely consequences of export bans are, in general, negative for producers, as they imply a tax on them which lowers the incentive to respond to the international price increase.

The recent food price episode also highlighted the unintended effects of direct intervention on the market and the fragility of the dual marketing system that characterizes most of the countries in the region. The price and the availability of food in Africa is a highly politicized issue. It is unlikely that governments will be willing to reform food markets and cease intervening directly. In this case, it is critical that the government and the private sector follow an integrated approach to market operations. A set of clearly defined and transparent rules, such as price thresholds for triggering government intervention are necessary, as well as the provision of credible information on export and import decisions, the quantities intended to be purchased and sold by the government agencies, as well as the respective prices. Policy makers may also consider the possibility of maintaining small strategic food reserves, instead of managing the market through larger inventories.

However it is important to note that within the context of price upswings, open market operations can result in lowering the price of food at very high costs and hence the policy may be effective only in the short run.

Chapter 6
Improving access to food and inputs: Consumption and production subsidies at the household level

Policy options for food security form a continuum including measures that guarrantee the availability of food at the national level, as well as micro-level interventions that aim towards safeguarding food security at the household level. The latter measures target poorer population groups and enhance their purchasing power. Often, the limited success of market related policies that aim to promote growth and food security in developing countries is attributed to a number of constraints at the micro-level. For producing households, most of these constraints are related to market failures that limit households' participation in the output and input markets. These limitations prompt governments to consider a range of policy options aimed at the household level.

Micro-level interventions are targeted to specific strata of the population and include policies that improve access to food and maintain food safety, as well as interventions that stimulate production and assure regular food supplies at the household level. This section discusses a range of policies, such as consumer subsidies, food safety nets and targeted or 'market-smart' input subsidies. Food safety nets, as well as targeted input subsidies, commonly implemented in developing countries, aim at vulnerable consumers and producers respectively. These measures do not directly affect market prices at the national level, as they involve transfers to specific population groups. The focus of the discussion lies on the effectiveness and feasibility of these subsidy programs, as well as on their facility to be implemented in a counter-cyclical manner, scaling-up the benefits during the price upswing and scaling-down when prices fall.

The recent price swing has led to the introduction of a number of subsidy programs aiming at mitigating the adverse effects on producers and consumers. A number of countries introduced universal consumer subsidies, while others where targeted safety nets were in place scaled-up the spending per person. Social safety nets attempt to alleviate poverty and food security by redistributing income to the poor and enabling vulnerable households to make investments and manage risks. Input subsidies among other objectives, aim at stimulating supply response and increasing the availability of food.

Within the context of food price swings, safety nets are an important instrument in mitigating the impact of the shock and maintaining the purchasing power of vulnerable

Figure 11 – Consumer subsidies, safety nets and input support implemented by African countries
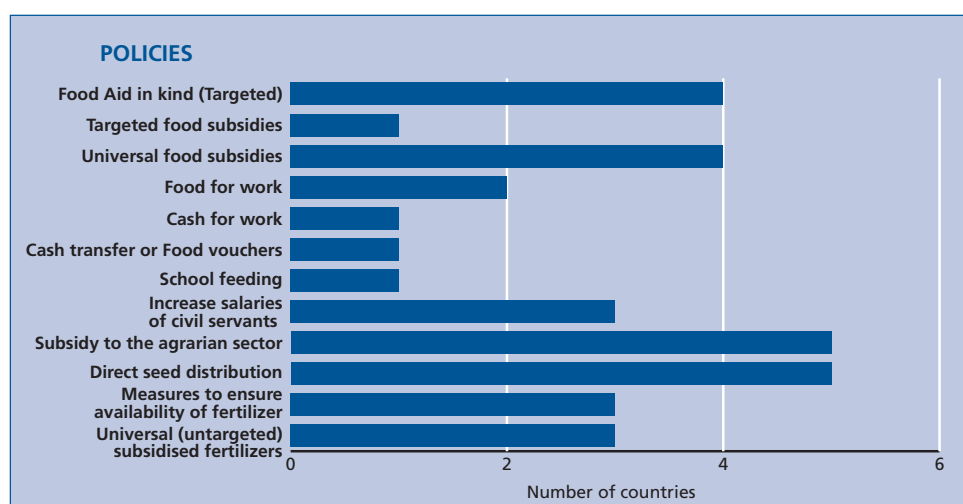
Source: Demeke, Pangrazio, & Maetz (2009)

population groups. As such, these nets perform an insurance function, rather than transferring income, and alleviate transitory, rather than chronic of poverty. In an environment of rapidly increasing food prices, the provision of subsidized food or cash to poor through safety nets improves their ability to cope with increased expenditure and prevents households from divesting in assets that are important for their well-being.

Input subsidies have been the subject of intense criticism in the past. Nevertheless, the success of several targeted input subsidy programs in sub-Saharan Africa, such as the Agricultural Input Subsidy Program in Malawi, have generated renewed interest in supporting input purchases. These programs assist cash-constrained farmers to utilize fertilizers and seed, improve technology adoption and stimulate input market development by expanding the input supply chain thereby, offsetting the rise in marketing costs. In periods of sustained commodity and fertilizer price increases, such programs enhance the ability of smallholders to respond to the increase in food prices and contribute towards national and household food security.

6.1 IMPROVING ACCESS TO FOOD: CONSUMPTION SUBSIDIES AND FOOD SAFETY NETS

A number of countries responded to the price upswing by subsidizing food. Universal food subsidies allow for a quicker response in improving access to food and in mitigating the first round impact of price increases however they are costly and do not effectively target those who really need support.

Removing or scaling down food subsidies also tends to involve a high political cost. For example, in Indonesia the government introduced a universal subsidy on rice, following increased domestic prices brought about by a drought in 1997 and the impact of the devaluation of the currency. The cost of the program rose to 1.6 percent of the gross national product, while it also provided incentives for re-exporting subsidized rice. This universal subsidy was replaced by a targeted subsidy program based on a quota determined by household survey data. Although the economy has improved and the price of rice stabilized, this subsidy was still in place in 2005 (Alderman and Hacque, 2006).

In Kenya, the attempt of the government to support the consumption of maize by introducing subsidies was not successful mainly due to the lack of targeting those who were in need (see Box 6.1). As households react to price changes by substituting one food commodity for another, governments can subsidize commodities that are self-targeted been 'inferior' and in general, consumed by the poor only. This is difficult as there are few commodities that are both consumed exclusively by the poor, and at the same time consist of a large share of the food expenditure of poor households.

In Eastern and Southern Africa, yellow maize, which is mainly used for animal feed, may be suitable as a self-targeted commodity. Dreze and Sen (1989) suggest that in 1985, following a drought in Kenya, the distribution of yellow maize resulted in an equitable allocation of the benefits, as consumers who could afford to purchase white maize chose not to consume yellow maize. Within the context of the recent food price hike, in Zambia, Chapoto, et al., (2008) argued that consumer subsidies should target the poor only by placing it on "roller" meal, an inferior product as compared with breakfast meal that is preferred by non poor households. In general, supporting 'self-targeted' foods results in households selecting to consume subsidized food according to their preferences and income, and thus excludes those who are not in need, leading to reduced policy costs.

Box 6.1: Non-targeted consumer subsidies in Kenya

In December 2008, the government adopted a direct consumer price subsidy by introducing a dual pricing strategy, whereby a 2 kg packet of maize meal would sell at a commercial rate of Kshs 72 and a subsidized rate of Kshs 55. The low-priced maize meal was intended to benefit the poor. However, there were no specific criteria for targeting the poor, except by transporting the low-priced maize meal to low income neighborhoods. The government at the same time increased its administrative producer price of maize from Kshs 1,750 per 90 kg bag to Kshs 1,950 in order to procure additional quantities of food. However, at the same time, the government directed the National Cereals and Produce Board (NCPB) to sell maize to millers at Kshs 1,750 thereby subsidizing producer price by Kshs 200 per 90 kg bag.

In order to support these pre-determined prices, the government released 1.2 million 90 kg bags of maize from the NCPB strategic grain reserves for sale to millers at the administered producer price of Ksh 1,750. However, there were serious problems in the way the subsidized maize was distributed to maize millers and the non-targeted distribution of subsidized food reduced the impact of the subsidy program. Consumers faced significant transaction costs, as they had to travel to distant NCPB depots to purchase the subsidized maize. NCPB also sold the subsidized maize in bundles of 50 kilogrammes making it still unaffordable to the poorest who could only pay for smaller packages. The subsidy, therefore, largely failed to make an impact. In March 2009, budget constraints led the government to withdraw the Kshs 200 per 90 kg bag subsidy, letting the price be determined by market fundamentals.

Based on Okello (2009)

In the medium run, and especially when the price increase is persistent, universal food subsidy schemes ought to be gradually phased out and replaced with well defined and targeted programs that effectively address the need of the population in the lower ranges of the income distribution. If safety nets are in place, the short run response to food price increases is to scale operations up by increasing the spending per person or relaxing the eligibility criteria to expand the targeted population groups. If safety systems are small and fragmented or provide partial insurance, policy options are limited to, most likely, food aid.

In an environment of rapidly increasing food prices, the provision of subsidized food or cash to the poor through safety nets improves their ability to cope with increased food expenditure and prevents households from selling assets that are important for their well-being, such as animals, or from cutting down expenses on important activities, such as education.

It is important that food safety nets can be scaled-up rapidly. This presents significant difficulties:

• firstly, the safety net program should have the administrative capacity to expand;
• second, if the expansion takes place through the relaxation of the eligibility criteria, so as to provide protection to households that became vulnerable due to the temporary food price increase, additional targeting mechanisms should be employed. Well-targeted programs are difficult to design and often are integrated into the existing social safety net system. Quick targeting may be achieved through combinations of geographical, demographic and self-targeting criteria, however compromises will have to be made on the accuracy of the targeting[8];

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[8] Grosh, et al. (2008) provide a comprehensive best practices' guide in safety net design.

• finally, such mechanisms ought to have a counter-cyclical budget so that operations can be scaled-up as need increases and scaled-down subsequently. Such budget requirements present significant difficulties – especially for many low income developing countries – as when food prices surge, or the economy slows down decreases in government revenue and increases in social expenditures happen at the same time.

A number of mechanisms, including cash transfers and food access approaches through in-kind distribution and food vouchers, can target vulnerable population groups and ensure food safety at the household level.

Targeted cash transfers constitute the best option. Such measures are appropriate where food markets function and improved access to food is the objective of the intervention. Within the context of food price increases, in addition to providing the ability to procure higher priced food, cash transfers also allow households to make decisions as to how to spend or invest the cash. For example, households that have produced sufficient food may need the cash for non-food consumption, or may have to finance investment. Cash transfers can also foster local food market development by providing greater incentives to the private sector to engage in higher volume, more stable marketing channels, thus achieving economies of scale.

Food vouchers can also become a parallel currency in food and other goods' markets. As such, they can have some of the positive effects of cash transfers in improving local market development, but tend not to be used for investment.

The manner to which such interventions can be targeted to provide relief to poor and vulnerable households is also important. Well-targeted programs are difficult to design and often are integrated with existing social safety net systems. Nevertheless, appropriate targeting that excludes the non vulnerable population groups can be achieved rapidly through a number of ways. In some contexts, increasing the wages of lowly paid public servants and workers, as a means of transferring cash, can assist poorer urban consumers. For example, the proposal to increase public sector salaries by 30 percent in Egypt was a response to the unrest over the high cost of food. Many low-paid public servants in Egypt are included amongst the poor and vulnerable (Demeke Pangrazio, & Maetz, 2009). However, poor households that are engaged primarily in informal sector activities may not benefit.

Food vouchers distribution schemes tend to have higher transaction costs than cash based measures and although the exclusion of non vulnerable groups may be the objective, the design of these interventions can be complicated (Grosh et al., 2008). Such programs can be scaled-up in the event of price upswings, by adjusting the value of cash transfers or the quantity of food vouchers in order to maintain poor households' purchasing power. Nevertheless, if prices increase rapidly, scaling-up can be administratively difficult. Scaling down spending, when prices fall can take place in a phased manner by reducing the value of benefits or the numbers of beneficiaries. In addition, for both cash-based and food voucher distribution schemes, it is important to avoid any potential disruption to private marketing channels.

If private traders are unable to scale-up the distribution of food, these approaches should only be implemented together with targeted food releases through public food reserves. This is necessary in order to avoid further food price increases. The distribution of food aid is most appropriate where insufficient food supply is the main reason for reduced consumption and when food markets do not work. For example, local markets may be isolated, or local producers may not be capable of responding to high prices by increasing

Box 6.2: **the productive safety net program in ethiopia:** **An example of** **public works schemes in an environment of increasing food prices**

In 2005, the Government of Ethiopia initiated the Productive Safety Net Program or PSNP, in order to provide reliable and timely support to chronically food insecure households in more than 260 counties. In 2008, the number of beneficiaries reached more than eight million. Technical and financial support is provided by a joint donor group that includes DFID, USAID, the World Bank, the European Commission and WFP, among others. PSNP is designed with the objective of mobilizing labour for public works activities that build infrastructure and assets to promote agricultural productivity and access to markets (e.g. feeder roads, soil and water conservation, micro-dams for irrigation). Food insecure people are offered guaranteed employment for five days a month in return for transfers of either 15 kg of cereals or the cash equivalent of US$4 per month for each household member.

In response to the food crisis, the Government of Ethiopia relied on donors to provide additional support to PSNP participants. The wage rate for public work programs was increased by 33 percent in January 2008. As prices continued to rise in August 2008, safety nets strained to provide sufficient support. Demand for food transfers increased sharply in the areas covered by PSNP, as the majority of households preferred food only (54 percent), followed by half food, half cash (36 percent), while less than one in ten said they would prefer cash only (9 percent).

The recent price episode highlights that vulnerability remains a major challenge, even if safety nets are in place. Addressing the problems of drought and land degradation, which are the main causes of vulnerability, requires a higher level of support at the household level and a major investment in irrigation, soil conservation and alternative sources of livelihoods.

Source: Demeke, Pangrazio & Maetz, (2009).

supply. In these cases, cash transfers or food vouchers can result in food price inflation, thus exacerbating the negative impact of the food price upswing. Food aid is more appropriate in such situations, as it increases the availability of food without exerting additional upward pressure on local market prices.

In-kind food distribution places a lower budgetary strain on government resources, as often foreign assistance is available in terms of food aid in kind. In addition, targeting in-kind food distribution is relatively easy. School feeding programs improve school attendance and allow poor households to continue investing in children's education. Nevertheless, such programs may miss target populations, such as poor households without children. Health centre, or clinic attendance feeding schemes also target the vulnerable, nevertheless they impose significant costs on the beneficiaries who have to travel in order to access the food.

Food or cash for work form the basis of a number of safety nets implemented by governments and non governmental organizations that aim to increase the income of the poor. Within an environment of increasing food prices, such public work programs increase the income of the poor and improve their access to food. These programs serve an insurance function, as they prevent the poor from depleting their assets and, in addition, create indirect benefits in the form of better infrastructure, such as roads and water and irrigation facilities.

Public work programs can be 'self-targeting'. This is achieved through setting the wages at a level which is attractive for the poor who are not employed, but not attractive to people

who are engaged in income-generating activities, such as agriculture. In this manner, only those who are really in need, participate in these schemes. It is important that the public works wage is set so as employment in the program does not replace other productive activities. For example, in rural areas where employment opportunities are non-existent, public works should be well-timed in order not to disrupt seasonal agricultural work. Nevertheless, with such schemes it is difficult to achieve sufficient geographic coverage to support all vulnerable groups in the country. On the other hand, public works provide an important form of assistance to the poor when no other safety nets are in place. Therefore, governments have to target areas where poverty is both widespread and deep.

Alderman and Hacque (2006) suggest that such programs can effectively be targeted and scaled-up in times of need. Scaling-up may be based on plans made at the community level that include a number of feasible public works and investments that can be undertaken in times of need. Such plans ought to be based on sound technical and environmental assessments so the programs have specific investment objectives and are not implemented in haste. Grosh et al. (2008) suggest that public work programs are effective in periods of widespread crisis which result in high rates of unemployment. This possibility of offering employment to poor and the vulnerable in times of need makes public work programs a likely policy option during economic recessions, such as the recent downturn in global markets. The ability to scale-up such programs is crucial (see Box 6.2). The Republic of Korea relied on public work programs during the 1970s, discontinuing only when old and unproductive people participated who were better assisted by cash transfers. Public work programs were resumed during the economic downturn of the 1997 Asian crisis (Grosh et al., 2008).

More importantly, the financing of public works schemes during international food price swings requires the ability to accommodate counter-cyclical budget expenditures. Countries may utilize their own revenues, or hold specific reserve funds for financing public works in times of need. In any case, during international price swings or other economy-wide shocks, the extent to which governments can meet the budgetary requirements is limited and foreign support will have to be mobilized.

6.2 FOOD SUPPLY-BASED APPROACHES: INPUT SUBSIDIES

Input support programs, such as direct input distribution, universal input subsidies and targeted market-smart subsidies help cash-constrained farmers and resolve problems related to risk, uncertainty and markets that do not function well. In developing countries, private sector participation is weak due to the small size of markets and their geographical dispersion. Variable input demand by smallholders and high transaction costs limit the economies of scale, resulting in poor input marketing systems. In addition to limited market access, volatile prices and income risks may also blunt the adoption of efficient technologies, such as improved seed and fertilizers. Smallholders may decide to apply less productive technologies in exchange for greater stability.

Universal input subsidies are thought of as maintaining soil fertility levels and improving productivity gains and food security in developing countries. Nevertheless, they distort production decisions and may lead to inefficient use of inputs. Such general subsidies also benefit large commercial farmers who are not in need of support and have been associated with very high fiscal costs, as compared with the benefits they have provided to the smallholders.

In many fora and development policy think-tanks the viewpoint on input subsidies, especially for Africa, has evolved. Policy makers, experts and donors view targeted input

subsidies as having a wider set of objective, including social as well as economic aims, as support is directed to poor and vulnerable smallholders. (World Bank, 2007; Doward, 2009). These objectives can be summarized as follows:

• national and household food security;
• input supply chain development;
• improvements in soil fertility; and,
• poverty reduction and social protection for subsidy beneficiaries.
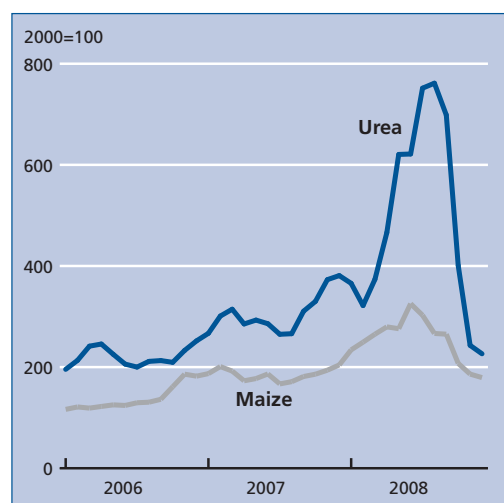
For the poor, increased production will enhance their wellbeing. As households' decisions on how much to produce and consume are non-separable, targeted interventions that aim to stimulate supply response will ensure food security at the household level. In a similar manner, safety nets that maintain food safety can have immediate positive effects on short run supply response through increasing household liquidity and allowing the purchase of productive inputs. This change in thinking is the result of the poor performance of input markets after the liberalization of African markets, as well as the evidence on the role of input subsidies in 'jump-starting' agricultural development in the Asian Green Revolution (Johnson, Hazell and Gulati 2003).

Specific targeted input support schemes have been the focus of governments in many developing countries, especially in Eastern and Southern Africa. Such schemes aim to stimulate food production and assure food safety at both the household and national levels by removing constraints that create productivity gaps, such as limited access to fertilizers and seed (see Box 6.3).

Within the context of the recent commodity price episode, input support schemes became more relevant due to the significant and rapid increases in the international price of fertilizers, relative to those of food prices. As food prices lagged behind fertilizer prices, expectations on lower profitability may have resulted in significant reduction in the use of fertilizers, affecting the livelihood of smallholders and hindering supply response (Figure 12).

A number of countries have introduced or have expanded input subsidies to assist vulnerable farmers and generate a quick supply response. The recent food price episode has, somehow, shifted the policy focus from household poverty to national food safety through food self-sufficiency, rather than through trade, and input subsidies are seen as a solution to stimulate supply response rapidly.

Figure 12 – International market price indices of urea and maize (2006–2008)

Source: International Financial Statistics, IMF.

Nevertheless, increasing food supply at the national level may require input subsidy policies that cover a wider spectrum of producers, possibly including large or medium scale farmers that may be more responsive to price signals, as compared to smallholders. Indeed, there have been a number of calls for such general subsidy schemes during the price surge. In Zambia, a study team commissioned by the Ministry of Agriculture and Cooperatives to review the Fertilizer Subsidy Program (FSP) proposed that if high fertilizer prices

Box 6.3: **INPUT SUBSIDY SCHEMES IN EASTERN AND SOUTHERN AFRICA**

Fertilizer subsidies have been an important policy instrument in **Zambia**. The Fertilizer Support Program (FSP) was initiated in 2002, and disburses an average of over 66 thousand tonnes of subsidized fertilizer per year. The fertilizer is imported by private companies under government tender and then distributed to smallholders through cooperative societies. The program is estimated to achieve benefits that are higher than its costs, with an economic benefit to cost ratio that is greater than 1. Additional investments in longer term research and infrastructure are expected to increase the program's cost-effectiveness.

The National Accelerated Agricultural Input Program (NAAIP) was initiated by the government of **Kenya** in 2007. NAAIP aims to promote food security, agricultural input use, input market development, and agricultural productivity. It has been expanded with plans to provide 2.5 million farmers with maize seed and fertilizers for 0.4 hectare each through vouchers issued to targeted disadvantaged households with land, and subsequent redemption through private input sellers who would also be eligible for trade credit guarantees.

In **Malawi**, a series of national input subsidy programs have been implemented during the past decade. The Agricultural Input Subsidy Program (AISP), the Targeted Input Program (TIP) and the Starter Pack Program (SP) have been subject to extensive analysis and evaluation and have attracted considerable international interest. The SP was implemented between 1998 and 2000 and involved the distribution of an input 'starter pack' comprising 15 kg of fertilizer and 2 kg of maize seed to all farm households. In 2000–01, the distribution of inputs was targeted to smallholders only, through the TIP. From 2005–06, however, the government took a different approach with a very large scale program, the AISP, providing about 50 percent of farm households with vouchers for 100 kg of fertilizer and small quantities of maize seed, with mainly privately imported fertilizers delivered principally, and in some years exclusively, by two parastatal input suppliers.

Source: Xu, Burke, Jayne, & Govereh (2008) and Doward (2009).

persisted, a universal fertilizer subsidy would result to increased maize supply (Govereh, 2009). In Zambia, large scale farmers, who normally produce about half of the total marketed maize, considered increasing the area under soybeans, a less fertilizer-intensive crop in order to maintain profitability in a period of rapidly increasing fertilizer prices. Such a universal subsidy would aim at increasing the availability of maize in the country. Such a policy, however, would lead to large costs that could also be prohibitive, while domestic food availability could be assured at a lower cost by subsidizing smallholders and by resorting to the international food market, given the relative international food and input prices.

In addition to generating benefits to smallholders without distorting the markets, targeted input subsidies contribute towards increased output, household food security and private sector development. Dorward et al. (2008) indicate that in Malawi, in the 2006–07 marketing year, the Agricultural Input Subsidy Program (AISP), in conjunction with a seed subsidy scheme, brought about a total maize production increase of approximately 24 percent as compared with the previous year. As increased supply lowers the price of food, smart input subsidies result in welfare gains for poor farmers and consumers, while less poor farmers and taxpayers carry the costs of the policy.

The participation of the private sector in the distribution of inputs is also vital. Given the proper incentives, private dealers can improve access to subsidized inputs for many farmers. Targeted input subsidies can assist in fostering the growth of input markets and in facilitating private sector development. The demand for increased input volumes helps traders and distributors to invest on marketing systems, thus achieving economies of scale

Box 6.4: scaling-up input subsidies in zambia

The government's response to the fertilizer prices was to scale up the program and to allocate more resources to the Fertilizer Support Program. In February 2008, Zambia's parliament approved the 2008 budget with a planned spending of US$42 million for fertilizer subsidies. As fertilizer prices trebled within months of approving the budget, the government was compelled to seek supplemental funding of an additional US$95 million. This was meant to cover the additional cost of procurement, as prices of urea had increased above US$1,200 per tonne.

The supplementary funds would also cater for an increase in the subsidy level from 60 percent to 80 percent. In addition, the government expanded the program by increasing the beneficiaries from 120,000 to 200,000 farmers and the subsidized quantities to be distributed from 50,000 to 80,000 tonnes. In the 2009 budget, the government plans to allocate US$110 million on fertilizer subsidies.

Govereh (2009)

Figure 13 - Scaling up the Fertilizer Subsidy Program in Zambia (2002/03–2009/10)
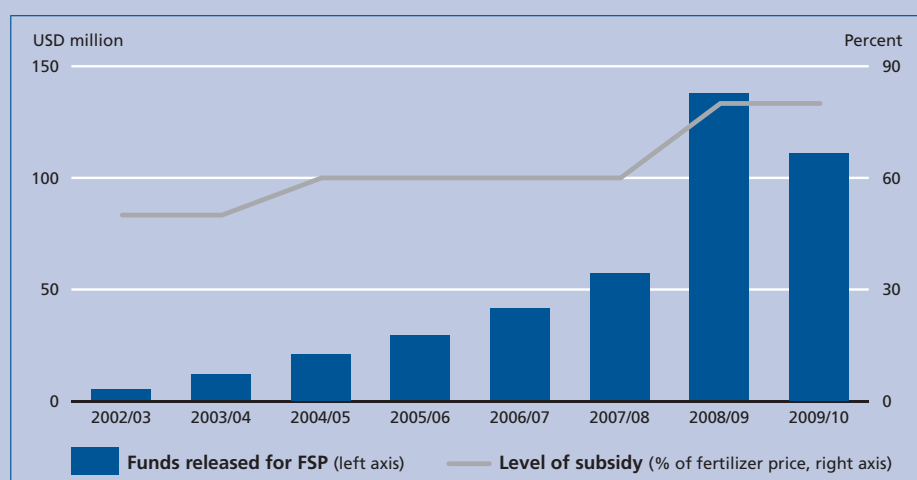
which, in turn reduce transaction costs. Further improvements in the efficiency of input marketing chains can be realized as the increase in the demand for inputs by farmers attracts new entrants, increasing the number of traders and enhancing competitiveness.

Within the context of price swings that are also characterized by increases in the price of inputs, as the recent price episode, fertilizer subsidy programs can be scaled up to assist agriculture, and especially smallholders to respond rapidly to increases in prices (see Box 6.4). Input subsidies lower input costs and increase the profitability of agricultural production for the poor, especially when food prices rise faster than input costs. If the increase in the prices of inputs is larger than that exhibited by food prices, input subsidies can assist in offsetting the negative impact on income. They enhance the ability of smallholders to respond to the increase in food prices and assure national and household food security. Increases in production result in price upswings in the domestic market becoming shorter in terms of time, as well as less pronounced in terms of magnitude, thus benefiting the consumers. It is important to note that targeting smallholders contributes to national food security, as

smallholders often tend to be more efficient in the cultivation of staple crops (Heltberg, 1998).

In periods of sustained price increases, market-smart input subsidies can also improve the ability of small farmers to save part of the price windfall either in cash or in other assets. Such savings or investments can assist poor households in smoothing their consumption effectively, providing crucial self-insurance against future shocks. Private traders also benefit from input subsidies during price upswings. Rapid increases in the price of inputs result in a contraction in their demand, thus eroding input suppliers' profits. Input subsidy programs assist in maintaining the volumes marketed and benefit input suppliers.

The extent to which market-smart input subsidies benefit producers and consumers depends on many factors, such as the accuracy of targeting, availability of adequate inputs, the timing of delivery, extension services and others.

- Accurate targeting of farmers who then increase input applications will result in increased food availability at both the national and household levels at a lower cost. Extending subsidies or input vouchers to middle-sized producers, who could finance input purchases, may result in a reduction in the demand for commercial fertilizers, harming the private sector and increasing the costs of the policy.
- Many researchers suggest that support ought to be targeted only at vulnerable smallholders, thus emphasizing household security. For example in Malawi, in 2006–07, the fertilizer subsidy program resulted in significant incremental use of fertilizer by smallholders that were characterized by a low value of household assets. Nevertheless, significant quantities of subsidized fertilizer were acquired by less poor households, displacing commercially purchased fertilizer (Doward et al., 2008). This suggests that better targeting is necessary to lower the costs of the policy.
- In Zambia the Fertilizer Support Program targets only households with land of more than one hectare who consist of about 75 percent of smallholders. Such targeting compels smallholders to form groups in order to be eligible for subsidized fertilizer (Govereh, 2009). Although, such grouping allows smallholders to be eligible for subsidies, it results in sub-optimal fertilizer applications, mainly due to lack of information and extension.
- In most sub-Saharan African countries fertilizer is imported, and the ability of traders to import sufficient quantities of inputs is vital for the success of the program. As input subsidies strengthen the demand for fertilizers, inadequate imports may result in the prices of fertilizer increasing, thus eroding the benefits of the policy.
- The timeliness of the delivery of fertilizer is important in increasing the effectiveness of the scheme. Fertilizer should be made available to producers well before the time of its application, as this is recommended by good agronomic practice. Extension services are vital in providing information to farmers to ensure that applications are effective.
- It is also important to note that the effect of fertilizer applications on yields depends on adequate rainfall. Doward et al. (2008) report that abundant and well distributed rainfall in the 2006 - 07 in Malawi ensured that the marginal product of both fertilizer and seed was high. Govereh and Wu (2007) estimate that correct application and adequate rainfall result to the ratio of the quantity of maize produced over the quantity of fertilizer applied amounting to 22.5, as compared to 11.8 realized under poor rainfall conditions. Correct application and adequate rainfall, cause the ratio of the quantity of maize produced over the quantity of fertilizer applied to be twice as much as the ratio realized under poor rainfall. This implies that, on average, the benefits of such schemes in rain-fed systems are subject to significant risk.

Although market-smart input subsidies have the potential to trigger supply response and assist in offsetting the negative effect of price upswings at the household level, they

represent a large fiscal burden and their effectiveness should be assessed against their costs. For example, the fertilizer subsidy program in Malawi represented approximately 43 percent of the Ministry's of Agriculture total budget in 2006–07 and 12.1 percent of total government spending, as compared with 3.4 percent in the previous year (Doward et al., 2008). Such a fiscal burden may suggest that such programs can become unsustainable. It also points to the difficulties in scaling-up during price upswings. The extent to which a developing country can expand input subsidies may be limited and may depend on the government budget constraints and foreign exchange reserves. Ethiopia provides an example of a country where the recent fertilizer price hike exacerbated foreign exchange difficulties. These were addressed by a grant and credit amounting together to US$250 million to provide foreign exchange for importation of fertilizers (World Bank, 2008a).

Food and input price upswings place significant demands on the management of input subsidy policies in terms of planning and timing. This may be illustrated by Malawi's experience with input subsidies during the recent price boom and slump. Rapid food and fertilizer international price rises in late 2007 and early 2008 meant that the relatively low priced fertilizer stocks - bought in the middle of 2007 - were used to produce maize harvested in 2008, a period when international prices were very high. The purchase of fertilizer for the 2008–09 input subsidy program was realized when prices were high, while the maize produced will be harvested between March and May 2009, when international maize prices are low, as compared with the previous season. These complexities, in conjunction with the effects on the budget, are likely to make the management and control of input subsidy program expenditures very difficult (Doward & Chirwa, 2009). They also highlight the need for complementary measures at other levels. For example, food price stabilization policies, the provision of financial services, such as credit and price insurance, can also assist in multiplying the input subsidy program benefits.

In general, although the evidence suggests that input subsidies may result in increased food production in the short run, it is difficult to estimate whether the policy leads to economically efficient outcomes in the sense that the benefits exceed the costs and more research is necessary. In addition, it is not clear whether in the long run, once discontinued, such programs will result in increasing fertilizer use by smallholders. If it is the lack of information that hinders the adoption of fertilizers one would think that such programs would assist in the diffusion of technology and farmers, once they 'graduate' from the program would continue using fertilizers. Evidence provided by field experiments in Kenya (Dufflo, Kremer and Robinson, 2008), suggests that farmers who participated in fertilizer provision programs are likely to continue applying fertilizer. Although the initial effect of the programs fades over time, fertilizer use is likely to remain permanently higher. This, in conjunction with the finding that fertilizer, when used in appropriate quantities, is highly profitable, suggests that the problem of technology adoption is multifaceted. Dufflo, Kremer and Robinson (2008) also analysed the effect cash constraints have on the demand for inputs. They concluded that offering smallholders the option to purchase fertilizer, at the full market price, immediately after the harvest, when they do not face cash constraints, leads to an increase of at least 33 percent in the proportion of farmers using fertilizer. This effect was found to be comparable to that of a 50 percent reduction in the price of fertilizer.

Such findings suggest that although better subsidy targeting, other smart input provision schemes, such as starter packs, are effective in stimulating fertilizer adoption and diffusion. Other interventions that may not affect the cost of the inputs, but enhance farmers' liquidity such as loan guarantees and credit extension for input purchases may also provide economically efficient and sustainable alternatives[9]. Nevertheless, even if farmers have

[9] The role of rural finance is examined in section 7.

access to credit for the purchase of inputs, during input price upturns, a targeted starter-pack distribution mechanism, or a subsidy scheme can be utilized in order to distribute lower cost fertilizer to the vulnerable.

More importantly, to engender a rapid supply response the policy options may have to also include agronomically smart nutrient use (Christiaensen and Demery, 2007). Often, the challenge is not more, but better nutrient use. For example, soils in South East Asia are widely deficient in potassium, while nitrogen is often overly used. In Indonesia, the limited use of potassium and other micro-nutrients may be linked to the current subsidization of urea production and the limited appreciation of the critical importance of an appropriate nutrient balance. Rebalancing the subsidies from nitrogen to potassium and utilizing a better fertilizer mix could increase yields, as about half of the soils in Indonesia are potentially potassium responsive.

6.3 SUMMARY

There is no blueprint approach to managing food price episodes and policy choices at the household level need to address the limited access to food or inputs. Micro-level interventions are targeted to specific strata of the population and include policies that aim at maintaining food security, as well as interventions that stimulate production and assure regular food supplies at the household level. Policies also ought to reflect the stage of agriculture sector development. There is a potentially strong relationship between measures to protect consumers against higher food prices and the enhancement of agricultural productivity. For example, in the early stages of a food price swing, interventions may be required to help maintain an adequate level of consumption, while increasing productivity is also important where market imperfections present critical constraints.

In an environment of rapidly increasing food prices, the provision of subsidized food improves the ability of the poor to cope with increased food expenditure and prevents households from selling assets that are important for their wellbeing, such as animals, or from cutting down expenses on important activities, such as education and health care.

Universal consumer subsidies allow for a quick response, but are costly and difficult to remove. The subsidization of foods that are exclusively consumed by the poor can reduce the costs of such policies. Nevertheless, there are few foods that are 'self-targeted' and the likelihood of success will depend on the consumption patterns in each country. In the medium run, and especially when price rises are persistent, general subsidy schemes ought to be replaced with targeted programs that address the need of the population in the lower ranges of the income distribution. If safety nets are in place, the short run response to food price increases is to scale operations up by increasing the spending per person or relaxing the eligibility criteria to expand the targeted population.

However, scaling-up food safety nets is not easy. The program should have the administrative capacity to expand, while if expansion takes place through the relaxation of the eligibility criteria, additional targeting mechanisms should be employed. Well-targeted programs are difficult to design and often are integrated into the existing social safety net system. Quick targeting may be achieved through combinations of geographical, demographic and self-targeting criteria, however compromises will have to be made on the accuracy of the targeting.

Public works programs may provide a good vehicle for protecting the poor, during food price upturn and economic slowdowns, if other safety nets do not exist. These programs

serve an insurance function, as they prevent the poor from depleting their assets and, in addition, create indirect benefits in the form of better infrastructure, such as roads and water and irrigation facilities. They are also effective in periods of widespread crisis which result in high rates of unemployment. Program expansion can be based on plans made at the community level that include a number of feasible public works and investments that can be undertaken in times of need.

On the production side, targeted or market-smart input subsidies can enhance the ability of smallholders to respond to the increase in food prices and contribute towards national and household food security. Such schemes, can lead to increases in production which, in turn, result in price upswings in the domestic market becoming shorter in terms of time and less pronounced in terms of magnitude, thus benefiting the consumers. Nevertheless, market-smart input subsidies involve high costs, while the management of such programs is difficult, especially during periods characterized by volatile food and output prices.

The Governments should assess the potential of input subsidy programs in light of the costs and benefits. Political pressures for expansion of input subsidies may lead to an unsustainable fiscal burden that may hinder, rather than promote long-run growth. During price upswings, a part of domestic food requirements may be met at a lower cost by resorting to the international food market, depending on international food and input prices and the production constraints a country faces. The implementation of market-smart input schemes presents a challenge for African governments. Unlike in Asia, where input subsidies provided a strong drive for the Green Revolution, Africa is characterized by poorer infrastructure that can hinder the development of efficient input marketing systems and rain-fed agriculture. Nevertheless the benefits of such schemes during price swings, as well as in the long term may be significant. In the long term, well targeted input schemes can assist in the adoption of new technologies, efficient use of inputs, well developed marketing systems and increases in the income of rural households.

In general, establishing good household support schemes requires considerable efforts in terms of targeting and setting-up distribution channels in cooperation with the private sector. Better nutrient use is also important and subsidies should promote a better fertilizer mix. Additional investments are also necessary to upgrade the transport infrastructure and provide the necessary extension services.

Finally, such mechanisms ought to have a counter-cyclical budget so that operations can be scaled-up as need increases and scaled-down subsequently. Such budget requirements present significant difficulties – especially for many low income developing countries – as when food prices surge, decreases in government revenue and increases in social expenditures happen at the same time.

Chapter 7
The role of rural finance in price swings

Well-functioning rural financial services are crucial in shaping the economic environment for producers and consumers during periods of price booms and slumps. In general, a large body of literature provides empirical evidence on the relationship between finance and development (see for example Levine, 2005 and Ncube, 2007). Finance widens investment opportunities, thus assisting in resources being allocated in an efficient manner, and provides instruments to hedge against risk.

Countries that successfully managed agricultural booms and slumps have provided information to producers on the nature and possible duration of the price swing and ensured the necessary conditions to farmers to save the windfall gains. For example, in Kenya coffee producers benefited significantly from the coffee price boom of the 1970s. The government provided information to farmers that coffee price increases were the result of a crop failure in Brazil and that the boom was a transient, rather than long lived phenomenon. Part of the price windfall was consumed, but the greater part of was saved, at a rate of 60 percent, and invested in assets (Bevan, Collier and Gunning, 1987). Although related to a cash crop, the 1970s coffee price episode highlights the importance of the financial sector in the management of price booms and slumps.

The success of policies which aim at stimulating investment during food price episodes, such as increases in money supply (Collier, 2007), depends on the rural financial services sector functioning well[10]. In addition, effective consumption smoothing also depends on net producing households being able to save so that they do not adjust their consumption when prices and revenues fall. Thus government policies should have to aim at creating incentives for privately-owned financial institutions to provide banking services in rural areas, as well as to stimulate demand for such services in order to increase households' savings.

7.1 SAVING AND INVESTMENT DURING PRICE SWINGS

Saving and borrowing offers a means for making choices on how much to consume and how much to produce at different points of time. The facilitation of this economic behaviour is fundamental to managing price swings. Policies that aim at smoothing the impact of price fluctuations on rural household income should answer two main questions:

• how much of the windfall profits producers are able to save; and,
• how much, when and where to invest.

These questions should be answered within the context of the country's trade position, food security objectives, the country's established crop patterns and the health of the macroeconomic environment.

As in most developing countries, agriculture is the largest economic sector, policies should facilitate farmers to translate any windfall profit into permanent income through investment in real and/or productive assets. It is important to note that windfall profits cannot be translated into investment in the short run. Investments in agricultural assets involve high start-up costs and can be realized when a certain amount of money is accumulated giving rise to phased investment behaviour (Collier, 2007).

However, agricultural commodity price booms do not always have a lasting positive effect on the sector. Farmers are either net buyers of food, or, if they are able to market any surplus

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[10] The role of monetary policy in stimulating investment during price upturns is discussed in section 8.

they often consume the windfall profits right away instead of saving and investing in assets. There are several reasons which suggest that such a choice is rational (Dercon, 2000). First, producers may receive only a part of the international price increase as the transmission of price signals from the international market to the household level is incomplete in the short or the medium run. Second, financial institutions are missing and producers have no access to savings accounts, or liquid assets other than money. Third, even if producers can open bank accounts, the rate of return in the form of interest is not attractive.

Price transmission aside, missing financial markets limit the ability of households to smooth consumption through savings and to finance investments at the later stage of the price swing, possibly complementing their savings through credit. In developing countries there is an urban bias with the banking sector being oriented towards financing industry and trade. For many banks, the provision of financial services to regions with low population density and poor infrastructure is not profitable for a number of reasons. First, poor infrastructure gives rise to relatively high start-up costs for bank branches and second, for financial institutions the high fixed costs of providing services render operations unprofitable in rural areas.

Rural households typically save or borrow small amounts of money frequently, while loan repayments are also realized in small installments. Small and frequent transactions incur high costs for financial services, while operations in low population density areas imply that banks cannot easily exploit economies of scale due to the small size of the market. The scarcity of such services results in many rural households in African countries being characterized by very low saving rates and thus low levels of private investment that give rise to chronic poverty.

Even if households have access to financial instruments often these are characterized by low rates of return. Often, transaction costs may be lower for saving in other near liquid assets such as jewelry, or even capital assets such as animals. Although households do accumulate such real assets in order to smooth consumption, their suitability as a means of saving for the purchase of productive inputs is quite limited both in terms of difficulties in adding to such real assets in a regular manner, as well as in terms of their depletion. Such an accumulation and decumulation of assets may blunt investment decision especially within the context of the food price swings where investments involve large fixed costs.

Missing financial services markets also affect the extension of credit. In addition to the high transaction costs banks face in the provision of financial services in rural areas, uncertain credit demand and high default risks hinder the supply of credit. In general, financial institutions do not engage in extending the provision of credit to rural areas. Their liquidity constraints result in the poor being rationed out due to asymmetric information, or purely due to rationing from the top as smallholders are characterized by low collateral and by higher fixed costs, as compared to larger farmers. In addition, the banking sectors in many developing and less developed countries are characterized by a wide spread between the lending interest rates and the average rate of return on savings, suggesting that it is not only transaction costs that determine the provision and the cost of such services. Banks are risk averse and maintain such wide spreads as they operate in an environment with high default rates and weak contract enforcement. Nevertheless, wide spreads between savings and lending rates may also be the result of non competitive banking sector and oligopolistic behaviour.

Optimal household saving-investment behaviour during food price swings depends on credit extension, as windfall savings may have to be supplemented by credit in order to finance the accumulation of productive or other assets. In addition, during the first phase of saving the windfall profit, the extension of credit may benefit poor smallholders who

typically work for wealthier farmers during peak planting and harvesting period, as they face significant liquidity constraints. For poor producers, such off-farm activities may result in poor and mistimed farm preparations, planting and harvesting, and consequently in an erosion of windfall profit. This is especially important, as sustained food price increases result in strengthening the demand for farm labour in rural areas.

7.2 POLICIES FOR THE RURAL FINANCE SECTOR

The relatively large up-front costs of investments imply that investments should be made after positive income shocks. During food price swings, agricultural households with marketed surplus will have to accumulate and save a part of the profit windfalls in liquid assets, before real investments take place. In a similar manner, price upswing windfalls have to be parted from consumption, so that producers maintain their expenditure behaviour during the price downswing.

Rural financial services' market failures, as well as the limited access to saving or credit instruments by the poor may result in producers being unable to save any of the price windfall or borrow. This market failure highlights the importance of government intervention in the sector in order to facilitate inter-temporal saving, investment and consumption choices. During the price boom, producers' consumption and saving behaviour will depend on the existing savings and credit mechanisms and their efficacy in allowing households to shift a part of current income to later periods.

In general, there is evidence that access to financial institutions rises with per capita income, as increases in wealth stimulate demand for financial services (Claessens, 2005). When analysing the relationship between income, consumption and savings, income can be divided into its permanent and transitory components, the latter being unexpected amounts of money accruing to households, such as presents in cash. The propensity to consume increases when the permanent income is high, while the propensity to save increases when the transitory component of income is high. For producers, commodity price boom windfalls consist of transitory income. Kiiza and Pederson (2002) estimate that in Uganda the marginal propensity to save out of both permanent and transitory income is very low, being 0.03 and 0.11 respectively, suggesting that government intervention is necessary if households are to open a bank account and save part of the windfall.

Government policies should aim in creating incentives to privately owned financial institutions to supply banking services in the rural areas, as well as to stimulate demand for such services in order to increase households' savings. Policies may include specific subsidies to the financial services sector, tax breaks, the provision of innovative instruments specifically aimed to food producing households and the poor, as well as initiatives that aim to increase the awareness of producers about saving and credit instruments.

A solution to missing markets could be provided through intervention in terms of subsidies. Specific one-time subsidies to financial institutions could offset the high start-up costs of financial operations in the rural areas. In the past, government subsidies aimed at offsetting part of the fixed costs of operation in the rural areas to ensure continuous provision of financial services to producers, while other support programs also attempted to ensure that poor farmers received subsidized credit.

Nevertheless, to date, the evidence suggests that such subsidies do not work (Hoff & Stiglitz, 1997, Claessens, 2005). Often, subsidies to financial institutions in developing countries are captured by middle-income households that already have access to banks,

BOX 7.1: **INNOVATIVE FINANCIAL INSTRUMENTS**

Low cost saving instruments, such as the Mzansi account in South Africa, are well suited to improve access to specific groups. The Mzansi account is a low income transactional banking account launched by the South Africa's four major banks in 2004. It aims at making banking more accessible to the nation and, specifically, to increase banking reach to all communities, including the poor. The account is aimed to those who never had a bank account before and it requires a minimum deposit of approximately US$4-5. Operational costs are kept low, as no monthly statements are produced, while information on transactions is relayed through a mobile phone messaging service. Banks often offer different saving instruments to clients with balances higher than a certain threshold in order to enhance the targeting of the policy.

In Kenya, the government is partnering with Equity Bank, a Kenyan-owned financial organization, to make agricultural credit accessible to small scale farmers. Equity Bank has in the last few years successfully targeted small and micro-entrepreneurs including small-scale farmers with credit and banking services. The bank lends to small farmers in amounts that are easily repayable and has easy application procedures making it attractive to small farmers. At the same time, Equity Bank does not demand collateral from the small farmers, instead using either savings, if any, or membership to a farmer group as a guarrantee.

A good example of an innovative saving instrument can be found in India, where Reliance Money, one of the largest companies, has linked with the country's post office and offers gold savings passbooks to rural and urban households. Although, traditionally Indians prefer to invest in gold and jewelry this saving instrument enables people to purchase gold without taking physical possession unless they decide to. Within the context of the price swing, as the price of gold has remained at relatively high levels, in spite of the economic recession, as compared to the return of other assets, such saving instruments consist of an attractive and more liquid alternative to the purchase of non or near liquid assets, such as jewelry.

Based on Okello (2009), The Banking Association of South Africa (2004), and The Financial Times (2009).

rather than benefiting the ones who actually need the improved access. This is especially prevalent in the case of subsidized credit, where weak controls may result in credit being extended to the households that are already well-connected to banks. Under certain conditions, subsidies may also have perverse effects and result in an increase in the spread, as banks attempt to recover their high fixed costs (Hoff & Stiglitz, 1997). This would result in low average returns on saving, rendering bank deposits unattractive, especially during price upswings when increasing energy and food prices, fuel the general price level.

Tax breaks to financial institutions which provide services in rural areas, such as reduction in the rates of business taxes, may be more effective in increasing the supply of financial services. The reduction in the cost of rural banking, in the form of specific and innovative saving instruments can also have a significant positive impact on the saving rate among rural households. Targeting rural population groups through innovative and low cost saving instruments require close collaboration between the banking sector and the government not only in terms of the design and innovative approach, but also in terms of initiatives to increase awareness among the targeted population groups and the take-up of banking services. Increased demand for financial instruments will result in financial institutions enjoying increasing returns to scale, making the provision of these innovative saving instruments profitable and sustainable (see Box 7.1).

There are also a number of policies that aim to increase awareness and exposure to banks, thus strengthening the demand for financial services. For example, in Uganda households are

exposed to financial institutions as the government requires that public secondary school fees must be paid to schools' saving accounts at commercial banks (Kiiza & Pederson 2002).

The potential of support policies and specific saving and credit instruments is highlighted by the success of non governmental micro-finance incentives in reaching the poor in a number of countries, especially in Asia. Although successful, such initiatives offer small loans and as they face high operating costs are heavily dependent on subsidies (Cull, Demigurc-Kunt and Morduch, 2008). In addition, their liquidity is constrained by the absence of inter-bank relations and credit. Commercial micro-finance initiatives, in addition to credit, offer saving instruments and may reduce their dependence on subsidies if innovative products result in increased efficiency and lower costs of financial transactions.

Another aspect of financial services is related to the reduction of covariate risk through insurance. In general, price increases are characterized by increased price volatility. The recent food price episode is no exception to booms and slumps price behaviour. The integration of food and energy markets through the processing of coarse grains to ethanol increases the likelihood of large and abrupt price swings, as shocks in the energy market can be transmitted to the food market. Increased price variability may result in low investment on capital and productive inputs and may blunt the adoption of technologies necessary for increased agricultural production, as producers may decide to apply less productive technologies in exchange for greater stability.

Governments may intervene in assisting the provision of commodity price insurance as self-insurance strategies, such as crop and income diversification and consumption smoothing, may hinder investment and, in general, may be inadequate to reduce income uncertainty. Market based derivative instruments that provide insurance for internationally traded commodities are an important policy option (Larson et al., 2004). Market based weather insurance that covers yields' risks has also been suggested (Skees et al., 2001).

Financial instruments, such as futures prices and options allow producers to hedge against unforeseen price declines and reduce their exposure to income risk. In developing countries, risk management based on the use of such instruments will most likely necessitate the involvement of marketing and financial intermediaries. Increased access to financial institutions may also assist in facilitating the supply of, and the demand for such price insurance tools.

7.3 SUMMARY

Money is the principal financial asset in developing countries. During food price swings, net producing agricultural households will have to accumulate and save a part of the profit windfalls in liquid assets, before any investments take place. In a similar manner, consumption smoothing entails that price upswing windfalls have to be parted from consumption, so that producers maintain their expenditure behaviour during the price downswing.

A healthy rural finance services sector is crucial in facilitating investment and consumption smoothing during price booms and slumps. Government policies should aim in creating incentives to privately owned financial institutions to supply banking services in the rural areas, as well as to stimulate demand for such services in order to increase households' savings. Policies may include specific one-time subsidies to the financial services sector, tax breaks, the provision of innovative and low cost instruments that are specifically aimed to food producing households and the poor, as well as initiatives that aim at increasing awareness among producers and consumers about saving and credit instruments.

Chapter 8
Riding the price surge and slump: Macroeconomic consequences and policies

The recession arrived at a time when most of the countries in the region were subject to increased vulnerability. The food and energy price boom of 2007–08 has resulted in significant increases in fiscal costs and current account deficits, as many countries experienced high food import bills and resorted to expenditure policies, such as subsidies and income support. In many countries, the price boom has also resulted in increased inflation, and accumulated debt. In low income food deficit countries, food price increases can lead to significant negative consequences at the macroeconomic level. Increases in food import cost will tighten foreign exchange constraints having a direct impact on food security and on the economy through the accumulation of external debt and the reduction of merchandise imports. Poor households have also suffered. The food price upswing has resulted in both an increase and a deepening in poverty.

Although food prices have declined in the global markets, in many countries in the region food prices remain at relatively high levels. The economic slowdown and the possibility of high unemployment, especially in the urban areas is expected to worsen the situation for the poor. Previous experience from the 1997 Asian crisis suggests that developing countries are extremely vulnerable to economic recessions. The current financial and economic crisis is having a particularly strong impact on the poorest. The combined effect of the price boom and slump, the global credit crunch, shrinking international trade and investment flows, the possibility of lower remittances and the effect of budgetary pressures on aid donors may reverse the progress made in reducing global poverty.

The impact of commodity price swings on the macroeconomic situation of developing countries is the focus of this section. The discussion highlights the negative effect of the price boom and slump on the wider economies of low income countries with a specific focus on Africa and examines a number of policy options. These policies may not be macroeconomic in their nature. Most of the policies discussed in the previous sections, such as consumer subsidies, safety nets and market-smart input support, consist of fiscal responses to either price increases, or decreases. These measures, although they cannot be characterized as macroeconomic, have macroeconomic consequences in terms of increased expenditures. Proposals for the implementation of monetary policy, a clearly macroeconomic response to the price swing, are also discussed only in view of its feasibility for strengthening investment in the agricultural sector.

The recapitalization of banks and generous investment packages are the standard policy reaction of developed countries to the financial and economic crisis. Low income developing countries have a limited scope for such solutions, however expenditure policies are necessary to effectively target population groups that are vulnerable to the decline in trade and the rise in unemployment. Safety nets and public works programs consist of policy options that aim to increase the purchasing power of the poor and the unemployed. Trade policy plays an important role. An escalation in protectionism is a common reaction to economic recessions, as countries hasten to protect their own vulnerable sectors from low prices. Nevertheless, concerted increases in trade barriers, both tariff and non-tariff, would further exacerbate the negative impact of weak demand on trade. Measures for supporting trade finance are also crucial given the tight credit conditions. As the private banks, which supply about 80 percent of trade credit globally, falter, governments should devise ways to share the risk and provide short-term solutions.

8.1 THE ECONOMIC MANAGEMENT OF THE PRICE SURGE

The downward long term trend in agricultural commodity prices during the past several decades has resulted in declining income, stagnating competitiveness and persistent

poverty for many developing and less developed countries where the economy depends on the production of a limited number of agricultural commodities. Food and energy price increases can affect positively the economies of commodity dependent developing countries, depending, in part, on the extent to which supply can respond. Although, food prices have declined since their peak in the first half of 2008, they continue to remain at high levels as compared with 2005, underlying the pivotal role of the agricultural sector in providing a basis for sustained growth. Although food producing and exporting countries can gain, low income food deficit developing countries have experienced increases in their food import bills with negative consequences for food security, the terms of trade, debt, and economic growth.

8.1.1 The impact of the food price surge on developing countries

Food exporting developing countries can experience positive effects, as increased food prices will raise the income of net producers, inducing increases in their consumption which may also benefit other sectors of the economy. Ultimately, the size of these benefits will depend on the extent to which supply can respond to increasing prices. Empirical evidence suggests that in developing countries with a large share of net producing households, high food prices may positively affect the labour sector and especially the unskilled workers and the poor (Polaski, 2008). Price increases strengthen the demand for farm labour, resulting in increased employment and higher unskilled workers' earnings, thus leading to a decline in poverty. Evidence on the dissipation of agricultural price upturns' windfalls to unskilled labour and the unemployed, a social pool which is closely related to the agricultural sector, is also provided by Chant *et al*. (2008) in the context of the 1994–95 coffee price upturn's impact on Uganda.

Nevertheless, this impact on poverty is far from uniform across developing countries, as it is the structure of the economy that determines how increases in income affect different sectors. Conforti and Sarris (2008) analyzed the case of Tanzania and suggest that commodity price increases may result in a general contraction in the employment of unskilled workers as high energy prices slow down economic activity in many sectors of the economy. This is because the effect of costly energy offsets the relatively small positive impact on agricultural employment.

For low-income food-importing countries, high food prices can result in inflation and increased food import bills that lead to the deterioration of the balance of payments and the current account (see Figure 14 where oil importers are compared with oil producing countries). In 2007, it is estimated that the value of food imported by developing countries increased by 33 percent as compared to the previous year. The effect of price increases on the terms of trade may be significant, especially for low-income countries for which the share of oil in total imports is relatively high.

High commodity prices may result in major repercussions on the whole economy, as countries give up more exports for the imports they receive, resulting in changes in the current account balance, decreased consumption and in a direct adverse effect on food security. Indirectly, high import bills for food and energy aggravate foreign exchange constraints, affecting the central bank's reserve position and reducing the country's import choices. Second round effects may also include the worsening of the position of low-income food importing countries, as the current account deficit may result in a depreciation of the exchange rate, thus amplifying import costs.

As deficits are frequently financed by international borrowing, high food and energy prices may result in the accumulation of external debt, with significant negative consequences for growth and development in the long term. Such a decrease in the rate of growth

Figure 14 – Impact of 2008 food and energy price increases on the balance of payments of selected African countries
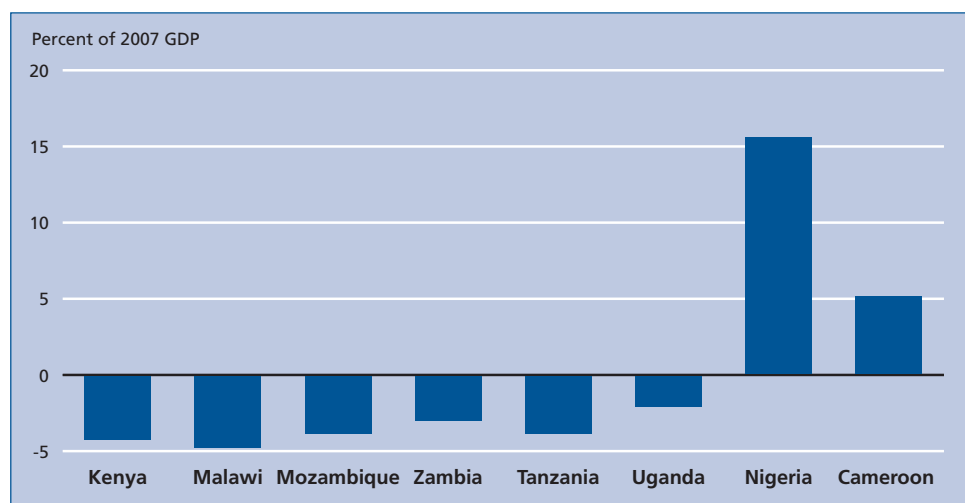
Source: IMF (2008)

can be further worsened if constrained foreign exchange reserves lead to the reduction of merchandise and services imports that are vital for the country's development.

8.1.2 Macroeconomic consequences and policy responses to increasing prices

The implementation of effective policies, either fiscal or monetary, in response to commodity price changes requires a careful assessment of their impact on the broader economy. In general, food price shocks and the policies implemented to offset their impact have macroeconomic consequences that necessitate macroeconomic responses. As higher food prices affect the economy primarily through changes in the balance of payments and the real exchange rate, there are many policy options at the macroeconomic level. Policy responses are diverse in nature and scope and may relate to fiscal choices and changes in money supply, targeting incomes, inflation and the exchange rate. In broad terms, two schools of thought emerge on policy options for the wider economy. On the one hand, some policy experts argue that effective management of price increases can be provided by a combination of trade, fiscal and monetary policies. On the other hand, others argue that sustained price increases should be considered only from a monetary policy point of view.

Fiscal policies attempt to influence the economy through changes in government taxation or through government spending. Changes in the level and composition of taxation and government spending can affect aggregate demand, the allocation of resources and the distribution of income. In food-importing countries, fiscal measures include import tariff cuts, tax reductions, subsidy increases, wage increases, as well as trade restrictions, such as export bans. The reduction or the elimination of import tariffs on food products has been the most widespread policy response for net food importing countries. Such policies have been examined in detail in section 5. Food subsidies and food and input safety nets, discussed in section 6, consist of expenditure policies which are, in general, more effective than taxes in redistributing income in developing countries.

In general, such micro-level interventions can lead to rapid increases in budgetary expenditures. Nearly three fourths of countries in sub-Saharan Africa used fiscal policies in order to respond to the food and energy price rise. Food taxes were decreased in 4 countries

in 2007 and in about 28 countries in 2008 (IMF, 2009), while several countries introduced both food and fuel subsidies. The fiscal costs of these fiscal measures doubled between 2007 and 2008, amounting to approximately one percent of the GDP in the region.

Increased budgetary costs may need to be met by increased government borrowing. Thus, governments ought to set a borrowing target in line with the country's needs, and, in addition, discipline a number of budgetary outlays so that expenditure results in a redistribution that favours the vulnerable. Budget considerations suggest that well targeted transfer programs that form part of an integrated social safety net system, may be preferable as instruments in providing support to vulnerable population.

Monetary policy proponents argue that the role of the government is to control inflation through monitoring of the exchange rate and the nominal supply of money. For food and energy importing countries, as increases in food prices as well as in energy prices lead to an increase in the general price level, exchange rate targeting may provide a policy option to stabilize domestic prices and mitigate their impact on the economy. For example, policies that result in exchange rate appreciation will limit the impact of international price increases on the domestic market, but will also result in moderating the gains to producers. Any intervention in the exchange rate should be met by corresponding changes in the money supply and thus exchange rate policies that aim to stabilize the price level are likely to induce continuing current account deficits leading to macroeconomic instability. Strict capital controls that also aim to maintain the exchange rate at a certain level may limit imports that are essential in meeting the country's development targets. If the full pass-through of international food price increases is accommodated, monetary policy should be tight enough to prevent inflation from spilling over to the rest of the economy and compromising national inflation targets.

In commodity-dependent countries, appropriate monetary policy can also ensure that farmers who receive the windfall income are able to save and invest a high proportion of it. Investments in agricultural productive assets are often lumpy and can be realized only when a certain amount of money is accumulated, giving rise to a response that is characterized by a savings phase and an investment phase (Collier, 2007). In developing countries, money is the principal financial asset and the management of money supply is central in facilitating investment and accommodating the increased demand for real assets. Collier (2007) suggests that in the first phase, governments may have to increase the supply of money in order to meet increased demand for money, as producers attempt to build their savings in liquid assets. As producers hold on their savings for future investment, the growth in the money supply will not have a positive effect on the price level. At the second phase, when producers turn their liquid assets into long-term real investment, money supply will have to tighten in order to prevent inflation from increasing. Nevertheless, policy makers have to carefully assess the impact on the inflation rate before embarking on monetary expansion. Such a policy measure will require a well-functioning rural finance services sector and attractive saving instruments so that any windfall profits are deposited, rather than spent, a response that would result in accelerating the rate of inflation.

8.2 THE 2008 FINANCIAL AND ECONOMIC CRISIS AND DEVELOPING COUNTRIES

The burst of the US subprime mortgage sector and the severe financial crisis that followed have resulted in a major economic recession and a slowdown in GDP growth. Unemployment is increasing as production in the manufacturing sector falls sharply. Major

firms failed and share prices plummet. Commodity prices also fell as the demand for goods contracted worldwide. Global GDP is estimated to grow by only 0.9 percent in 2009. For the same year, the developing economies, as an aggregate, are expected to grow by 4.5 percent, as compared with a 7.9 percent growth in 2007. Global trade is also projected to decline for the first time since 1982 (World Bank, 2009).

The current financial crisis is characterized by a number of attributes that differentiate it from the other major economic crises developing countries experienced during recent decades. First, the crisis had its origins in the developed world and the largest part of the negative effect is transmitted to the developing economies through a number of specific channels. Second, the crisis evolved during a period characterized by a high degree of financial integration globally, with the financial markets been central in determining economic activity. Third, the crisis follows a major energy and food price boom which has, already, weakened the economies of the developing world.

### 8.2.1 The impact of the financial and economic recession on developing countries
The slowdown of the global economy is already affecting developing countries through a number of channels. Increased risk weakens capital flows and foreign direct investment (FDI) to developing countries, while high unemployment in developed countries affects migrants' remittances. Falling commodity prices, decreases in the demand for exports due to the economic recession, constraints imposed by tight trade finance also affect exporters' revenues and reverse the benefits reaped during the past years. Developing countries that depend heavily on exports, or remittances and experience high current account deficits are the most vulnerable.

Poor households are also strained. The food price upswing in 2007–08 resulted in both an increase and a deepening in poverty. Although food prices have declined, food continues to be expensive. The food price boom, followed by the economic slowdown and the possibility of high unemployment, especially in urban areas, is likely to reverse the progress made in combating global poverty and worsen the situation for vulnerable population groups. The World Bank (2009) estimated that the economic slowdown in 2009 will add 64 million people to those living on less than US$2 per day, on top of the 133 - 155 million which fell into poverty due to the food price upswing worldwide.

The economic recession is expected to significantly affect African countries. After a period of economic growth, the GDP growth rate of sub-Saharan Africa declined to 5.4 percent in 2008 from nearly 7.0 percent in 2007 (IMF, 2009). The forecasts are pessimistic (Figure 15). The IMF projects that for 2009 the GDP growth rate of sub-Saharan Africa will slowdown to 1.5 before recovering to a rate of 3.8 percent in 2010. This recession arrives at a time when most of the countries in the region are subject to increased vulnerability. The food and energy price boom of 2007 - 08 has resulted in significant increases in fiscal costs and current account deficits, as many countries have resorted to expenditure policies, such as subsidies and income support in order to offset the negative impact of expensive food and energy (see Box 8.1 for the case of Zambia).

The extent to which the financial crisis will affect sub-Saharan Africa countries depends on the development of their financial system and the linkages with global financial markets. Previous evidence suggests that developing countries with open capital accounts are particularly vulnerable to economic recessions. Charlton (2008) stresses that during the Asian crisis in 1998, the number of poor in Thailand, Indonesia, Malaysia and the Philippines, increased by 60 percent. These countries had liberalized their financial markets, as part of a freer capital market process that characterized the 1990s. Capital market liberalization enhances the integration of financial markets across countries and it has been thought of being an important driver off growth and efficiency.

Figure 15 – Real gross domestic income growth projections (1997–2010)
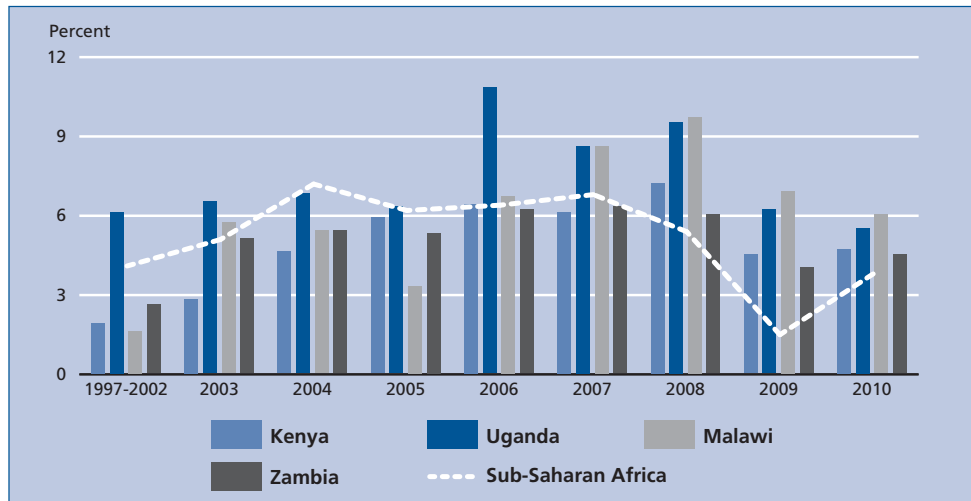
Source: IMF (2009)

Nevertheless, the relationship between capital account liberalization and growth is controversial. In a similar manner, the role of open capital markets in triggering economic crisis consists of a contentious issue. Stiglitz and Ocampo (2008) stress that open capital markets do not necessary lead to growth and efficiency, but increase volatility and risk. Volatile financial environments are the result not so much of the liberalization of rules governing foreign direct investment, but of those affecting short-term capital flows, speculative capital that can come into and out of a country rapidly.

Although capital flows may not be the direct cause of financial and economic crises, they play a central role in the transmission of the crises. In integrated markets, the problems of financial bubbles' bursts are exacerbated by the rapidity the economic downturn spreads. The empirical evidence on the impact of economic crises on the poor suggests that, during economic downturns, financial market integration and liberalized capital markets also exacerbate the negative impact on the poor (Charlton, 2008). During the Asian crisis, opening the capital market, tight fiscal policies, high interest rates and floating the exchange rate had a disproportionate negative impact on the poor. The current crisis has a significant negative impact especially on the emerging economies with vulnerable financial sectors and large current account deficits.

In sub-Saharan Africa, with the exception of South Africa, the financial sectors of most of the countries are characterized by a narrow range of financial institutions and limited integration with the global financial market. These attributes suggest that the financial sector is not an important channel through which the global economic crisis will spread. Nevertheless, the financial crisis, as well as the uncertainty that characterizes the economic environment result in foreign investors divesting from government securities, the debt and equity markets of developing countries. This flight of capital has lead to currency depreciations and higher inter-bank rates in a number of countries (IMF, 2009).

One of the main channels of transmission of the economic slowdown from developed to developing countries is through FDI. The year 2008 marked an end to a cycle in international investment which started in 2004 and reached a peak of US$ 1.8 trillion in 2007 (UNCTAD, 2009). As the economic recession deepens, tighter credit conditions, falling corporate profits, uncertainty and volatile macroeconomic environment lead to

BOX 8.1: ZAMBIA: THE IMPACT OF ECONOMIC RECESSION IN RESOURCE-RICH COUNTRY

Zambia's GDP growth averaged 5.1 percent per annum from 2002 to 2007 on account of a favorable international environment and effective economic management. During the same period, per capita income rose from US$360 to US$934. Single digit inflation rates had been achieved for the first time in Zambia, with declining interest rates and a relatively stable kwacha. Zambia was on course of achieving its 2030 vision of attaining a middle income country status until the triple threat of global oil crisis, food price upturn and financial markets turmoil threatened Zambia's macro-economic stability.

Zambia was not spared by the global rise in food and energy prices in the first three quarters of 2008 despite not being fully integrated with the world markets. In the second half of 2008, Zambia was affected by the financial crisis in terms of higher cost of borrowing, reduced capital flows and declining demand for its copper. In 2008, Zambia's external position worsened due to a sharp deterioration in the current account. The rise in world food, energy and fertilizer prices caused merchandise imports to increase by 29.7 percent. Zambia's budget deficit declined consistently from 3.6 percent of GDP in 2005 to 1.6 percent of GDP in 2007. The expectation to lower this deficit further in 2008 may have been realistic because of the unexpected expenditure on presidential by-elections and the need for a huge supplemental budget for subsidizing fertilizer and maize meal. These expenditures alone may have increased the projected 2008 budget by approximately 10 percent.

Meanwhile, in 2007, the unexpected 61.8 percent decline in realized copper prices from 2nd quarter to 4th quarter led to a meagre 3.2 percent rise in merchandise exports. Overall the balance of payments surplus narrowed to US$ 45.7 million from US$ 310.5 million in 2007. One of the consequences of this deteriorated external position is the depreciation of the kwacha.

Increased budget deficit in conjunction with the uncertainty underlying the financial markets due to the crisis resulted in portfolio investors withdrawing from government securities market and in an increase in the yield rates. The liquidation of their assets fuelled increased demand for foreign exchange. The slump in global demand for copper led to a steep fall in copper prices. Given that exchange rate mirrored changes in copper prices, the sharp decline in copper prices led to a rapid depreciation of the kwacha. Unlike fuel prices which declined, food prices remained high in Zambia long after world prices fell. Commercial banks were also compelled to increase their lending rates.

In 2008, interest rates were expected to decline further from 24.4 percent in 2007, but instead increased to 26.9 percent as at end-December, 2008. As the financial crisis spread globally, foreign investors also released their capital tied in various stocks listed on the Lusaka Stock Exchange (LUSE) triggering further divestment and resulting in significant losses with the LUSE All Share Index declining sharply from 4,440 points in March 2008 to 2,800 points in November, 2008.

Govereh (2009)

reductions in production and employment, as firms are not able to finance new projects. Such a slowdown in economic activity affects FDI. Nevertheless, preliminary estimates show that it is the developed countries that experience significant FDI reductions mainly due to problems that affect financial institutions and the inter-bank credit freeze that constrained the liquidity of the market. UNCTAD (2009) stresses that for many developing countries FDI flows showed resilience at least in 2008. Their estimates suggest that FDI inflows to developing countries have continued increasing in 2008 by a rate of 4 percent. For Africa as a whole, FDI flows in the same year increased by nearly 17 percent, however from a very low level of US$ 53 billion to US$ 61 billion.

Nevertheless, these estimates may not reflect the critical situation in African economies as the effect of the global financial crisis and the subsequent economic recession began to be transmitted to Africa in the last quarter of the year 2008. It is not yet clear how the decrease in global FDI will affect sub-Saharan Africa. The bulk of foreign investment in this region is directed to mining, a sector which is experiencing sharp decreases in prices. As it is the automotive industry, and the construction sector that are the worst hit by the crisis, medium term prospects for FDI flows in sub-Saharan African resource rich countries may be pessimistic. It is possible that the fall in commodity prices will further slowdown such resource-seeking FDI flows, as investors' interest on minerals weakens.

The economic recession is bringing about a significant reduction in employment opportunities in developed countries, especially in sectors that are characterized by a high concentration of migrants, such as construction and retail. In the third quarter of 2008, remittances already experienced a slow down. In total, for 2008, remittance flows from developed to developing countries declined from 2.0 to 1.8 percent of the GDP of the recipient countries (World Bank, 2008b). Nevertheless, remittances are thought of as the least volatile sources of foreign exchange earnings for developing countries, being persistent over time and resilient to economic cycles relative to capital flows (World Bank, 2008b). They are sent by cumulated flows of migrants over the years and consist of a small part of their income. Remittances also tend to be counter-cyclical, increasing when the recipient countries experience an economic downturn.

For sub-Saharan Africa the level of income in developed countries is an important factor and the region will be especially vulnerable to the global economic slowdown. Previous analysis on remittance flows income in sub-Saharan Africa suggests that a one percent decline in growth in host countries would result to 4 percent decline in remittances (IMF, 2009). Already, remittances to the region are estimated to decelerate sharply from a high growth rate of 42 percent in 2007 to approximately 6 percent in 2008. This growth is expected to further slowdown to about -1.3 percent in 2009 before recovering in 2010. Although the appreciation of the US dollar and the resilience of the Euro are expected to compensate for lower remittances, a number of small sub-Saharan African countries, such as Comoros and Lesotho where remittances consist of 20 percent of the GDP, will be especially vulnerable.

Perhaps, the most important channel through which economic recession will affect developing countries is trade, as the prospects for economic recovery remain negative. The slow growth of the global economy leads to a reduction in the demand for exports and declining trade volumes. This, in conjunction with depressed commodity prices, leads to declines in export earnings that are vital for many countries which had experienced current account deficits due to the price upswing. According to the IMF, sub-Saharan Africa will be subjected to a significant contraction in exports, as compared with the previous five years (Figure 16). On average, the region's current account deficit is estimated to be equal to 8.5 percent of the GDP in 2009. Although, some countries, especially the oil exporters, are equipped with stabilization funds, many more developing countries face dangerously high budget and current account deficits that make the preservation of their industries and recovery very difficult. Exporters of oil and minerals are, generally, expected to be hit the hardest, given the sharp decline in the prices of these commodities. Nevertheless, according to the World Bank (2009), resource rich countries, on average, have been successful in managing the commodity upswing and thus, have accumulated fiscal resources to finance expansionary policies or targeted interventions during a downturn.

In general, the trade performance of African countries will be significantly affected, as they have been progressively more dependent on international trade, increasing their

**Figure 16 – Sub-Saharan Africa: Trade and current account projections as a per-
cent of GDP (1997–2010)**
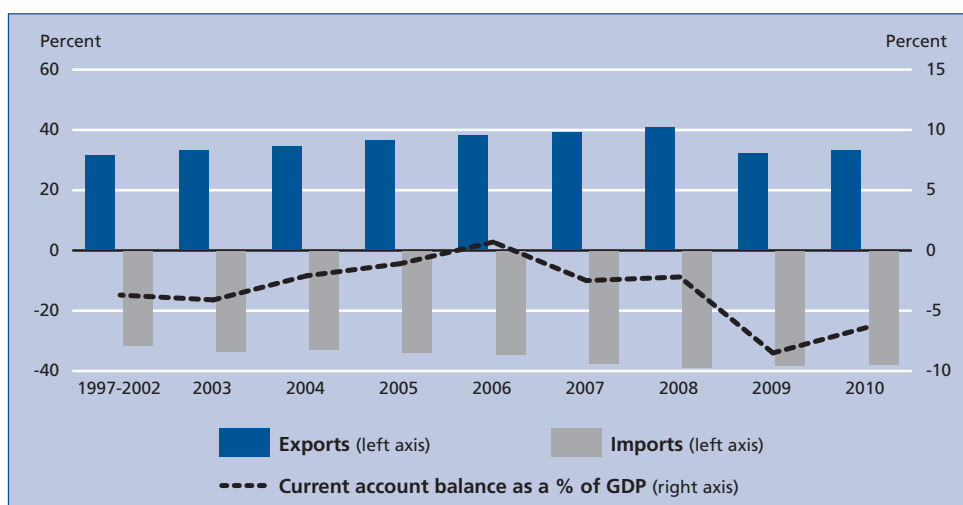
exposure on foreign markets. For example in 1995 in Africa as an aggregate, exports
accounted for 22 percent of the GDP. This share rose to 50 percent in 2007. Less developed
countries are even more exposed to external markets (UNCTAD, 2009).

Exporters of oil, such as Nigeria, and metals, such as Zambia will be severely hit.
The impact of the economic slowdown is also being felt in the agricultural dependent
economies. As prices of agricultural commodities decline, export revenues get smaller,
resulting in significant losses for agricultural export orientated countries. The international
prices of traditional exports such as coffee, cocoa and cotton, have declined substantially.
For example, in the six-month period between June and December 2008, the international
prices of coffee and cocoa declined by 19 and 25 percent respectively, while the price of
cotton declined by 28 percent. As these commodities constitute the bulk of exports for
many countries, the decline in export revenues can have significant repercussion on their
economies. In some countries, while agricultural export revenues are rising, they are falling
short of pre-crisis targets. In Ethiopia, coffee exports in March 2009 amounted to US$221
million as compared with a target of US$446.7 million. In Uganda, in March 2009, receipts
from coffee exports amounted to US$23.9 million, a sum that is 34 percent lower when
compared with export revenues in March 2008. Similarly, in Kenya, tea export revenues
are projected to decline by 7 percent between 2008 and 2010 (African Development Bank,
2009).

OECD and FAO (forthcoming) forecast that the economic slowdown will significantly
affect agricultural trade in Africa. A decline in the global rate of growth from 1.3 percent
in 2008 to about -0.4 percent in 2009 and a gradual recovery to 2.7 percent by 2012 will
result in declining exports, thus widening the agricultural trade deficit in Africa at least
twofold as compared with the trade deficit in 2000 (see Figure 17).

As a second round effect, lower commodity prices, in conjunction with restricted access
to credit, may also lead to declines in productivity as cash-constrained producers are unable
to purchase fertilizers and other inputs. This will lead to lower agricultural production, and
further declines in exports.

Figure 17 – Africa: Net agricultural trade index forecasts (2008 - 2018)
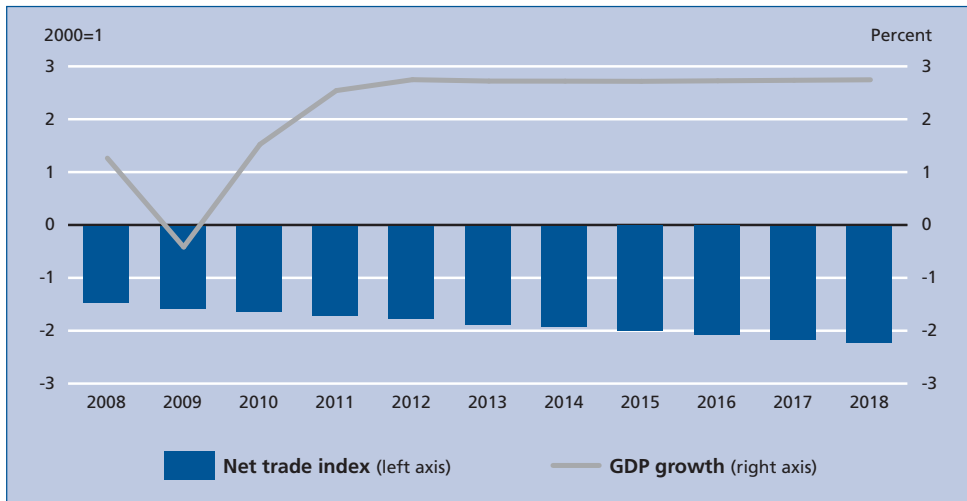
Source: OECD-FAO (forthcoming)

Current account deficits in conjunction with the flight of capital also lead to wide fluctuation in exchange rates, further discouraging trade. However, the impact of the crisis on trade can also be realized through industrial, as well as financial links between firms. International supply chain arrangements have resulted in globalized trade finance along with production. Sophisticated supply-chain trade financing facilities have become crucial for many small and medium size firms in both developed and developing countries. The tight financial conditions and the liquidity constraints faced by banks may result in them being unwilling or unable to provide trade finance. For example, Humphrey (2009) stresses that in the Asian crisis of 1997, sharp falls in the availability of trade finance caused problems for importers in countries such as Indonesia. Indeed, concerns about the scarcity of trade finance for developing and low-income countries have been identified as an issue in the WTO since the Asian crisis, as such countries are rapidly affected by increases in risk and liquidity shortages (Auboin and Meier-Ewert, 2008).

Trade finance consists of extending credit to an importer or advancing payment to an exporting firm to ensure that it has sufficient working capital for the period before the shipment of the goods. Often, banks in exporting countries also extend loans to foreign buyers to finance the purchase of exports. From the banks' perspective financing trade is a low risk and high collateral operation. Nevertheless, in the course of 2008, the overall liquidity squeeze has started to negatively affect the supply of trade finance. Detailed information on the tightening of trade finance is scarce. Some 80 to 90 percent of world trade relies on trade finance, including trade credit and insurance. Auboin (2009) stresses that as early as November 2008, there was a difference of around US$25 billion between the supply and the demand for trade finance, out of a global market estimated at some $10 trillion a year. Further decreases in the supply of credit may be detrimental. A past study undertaken by the IMF stressed that the potential impact on the real economy of shrinking trade finance in times of crisis may be significant (IMF, 2003).

The globalized nature of supply chains has exacerbated the impact of tight trade credit. Banks tend to finance a trade or production operation on the basis of a number of factors, including their liquidity, the perception of the macroeconomic environment, the performance of the sector and firm-specific characteristics, such as their direct business connections and backward or forward linkages (Escaith and Conguet, 2009). For example,

in vertically integrated supply chains the default of a client can have a significant impact on suppliers. As suppliers cannot shift rapidly to trading with other clients, banks are careful when assessing the credit worthiness of vertically integrated firms.

In a like manner, the contraction of demand due to the economic recession also affects negatively the ability of a firm to obtain trade finance. Low demand for primary goods results in increased suppliers' costs, leading to a further weakening of their credit position. Naturally, decreases in trade finance result in scaling down operations, which in turn, affects production, clients and suppliers throughout the chain. In other cases, especially in developing countries, the integration of an exporter within a supply chain with clients in developed countries may assist in securing trade finance, if the sector the firm operates in has not been significantly affected.

It is not yet clear which sectors may be worst affected by shrinking trade finance. Firms in sectors such as automobile and other manufacturing are expected to suffer most, especially in emerging economies of which the banking sector has been significantly affected. In many developing countries, as banks may have not being hit by the financial crisis, trade finance may have not been affected. Humphrey (2009) reports the findings of a survey across 30 medium and large scale firms in Africa operating in two export-oriented sectors: garments and horticulture. The results suggest that as of March 2009, few of these firms faced any problems with respect to the availability of trade finance. One explanation is the domestic banking system is resilient to the crisis, extending loans to firms that are creditworthy.

In general, exporting horticulture firms are considered as low risk by local banks mainly due to well-established relationships with clients along a supply chain where trade is sustained by inter-company credit. Horticulture exporters in Africa sometimes do not rely on banks for trade financing and provide credit to their clients, having accumulated financial resources to cover the period between shipment and payment. In other cases, clients provide advances to their suppliers. In the case of garment firms, the survey shows that there is greater reliance on finance, but most firms continue to rely on their parent companies for credit provision (Humphrey, 2009). However, a major problem reported by the sector is the declining demand for garments, as compared to that of horticultural products. Such a contraction in demand can lead to an increase in costs and a weakening of the sector's creditworthiness.

Humphrey (2009) also stresses that in Central America, horticultural suppliers face more severe constraints due to withdrawals of bank credit, while in Africa, there is evidence that restrictions on credit in the domestic market are negatively affecting small traders and cooperatives that do not have the formal linkages to access inter-company credit. This suggests that small firms which operate outside well-integrated supply chains are not viewed upon as creditworthy when credit rationing takes place. This signifies that the impact of the financial crisis on developing country exporters is highly differentiated by sector, and by type of firm.

8.2.2 *Policy responses to the economic recession*
Policy responses are crucial in safeguarding the financial system, protecting the vulnerable and in creating a favourable environment for economic recovery. A number of developed countries have resorted to recapitalizing or salvaging banks in order to ensure the supply of credit. Often, these measures are accompanied with special conditions aimed at maintaining the access to credit for small and medium enterprises, which are the most vulnerable. Many developed countries, as well as emerging economies have also introduced a series of fiscal measures. Public investment programs feature highly in these policy options. United States, France, Germany, Spain and China have introduced such investment programs, while other

countries, such as the United Kingdom, have announced VAT cuts (UNCTAD, 2009). All these measures aim at boosting economic growth, restoring confidence in the economy and creating opportunities for direct investment.

Similar investment packages have been introduced on a smaller scale by some developing countries such as Brazil, India, the Philippines, Thailand and the Republic of Korea. Other measures supporting trade finance are already in force. Expenditure and other policies will depend on the balance of payments constraints countries face, the extent of public debt and the existence of well-developed bond markets that will help the government finance its deficit. For middle income countries with strong debt positions and sufficient foreign currency reserves, monetary and fiscal policies form an effective option (Griffith-Jones and Ocampo, 2009). Nevertheless, as far as low-income developing countries are concerned, the scope of recapitalizing banks and initiating large public investment programs is limited. Given that most of the low-income countries are experiencing significant current account deficits, domestic policy options, as well as international responses include:

• safety nets effectively targeting the vulnerable population groups from reduced income;
• prudent trade policy without attempting to protect the domestic sector by increasing tariffs;
• export promotion and facilitation of trade finance; and,
• increases in external financing in terms of aid.

Universal fuel and food subsidies are definitely unsustainable in an economic environment shaped by recession. Social targeted safety nets, such as conditional cash or food transfers, already discussed in section 6 should be the main policy option for low-income developing countries. Such schemes attempt to alleviate poverty and food security by redistributing income to the poor and enable vulnerable households to manage risks. They also prevent the poor from depleting their assets that are important for their well-being.

Public works programs tend to have narrow geographical coverage. However, they provide an important means of assistance to the poor when no other safety nets are in place, especially during economic recession periods when the rate of unemployment is high. For example, the Republic of Korea introduced public work programs during the 1970s, and withdrew these programs when there was little demand in terms of willingness of people to participate. Public work programs were resumed during the economic downturn of the 1997 Asian crisis in order to provide income safety nets to vulnerable population groups (Grosh et al., 2008).

In addition, public works programs create indirect benefits, especially for agriculture, in the form of better infrastructure, such as roads and water and irrigation facilities. Such investments increase the efficiency of the sector, lower transaction costs and marketing margins and, overall, attract FDI.

Prudent trade policy is also of paramount importance. Between the years of 1929 and 1932 during the Great Depression trade between the industrialized countries contracted by about 30 percent. Madsen (2001) estimates that trade declined only by 14 percent due to declining income. Discretionary increases in import tariffs brought about a further 8 percent reduction in the volume of exports and imports. An additional 5 percent decline was due to deflation-induced tariff increases, and a further 6 percent because of the imposition of nontariff barriers. Trade restrictions appear to have contributed to shrinking trade more than the decrease in income.

The current economic recession has naturally raised concerns in many countries that have been followed by calls for the protection of the domestic industries to safeguard employment and incomes. At the G20 Summit in London on April 2009, world leaders pledged to arrest any escalation in protection. The imposition of trade restrictions by developed countries would lead to a decline of exports from developing countries and might trigger retaliation by other developed exporters. At a second-round, as developing countries' exports contract, their income falls, leading to a decline in their imports. If imports do not decrease as much as exports, a likely situation given the import requirements of developing countries for manufactures, the exchange rate may depreciate, leading to a further decrease in imports.

As WTO rules apply, increases in import tariffs cannot be raised in excess of the bound tariff levels. Nevertheless, for many countries the difference between applied and bound tariffs is quite large, thus providing opportunities for increased protection. Increases in protection can also be 'murky' consisting of subsidies, abuses in health and safety regulations (Baldwin and Everett, 2009). Gamberoni and Newfarmer (2009) provide a list of such protection measures in a number of sectors and stress that where direct payments to agricultural producers in developed countries are determined by the international price level, the collapse of prices would result in an increase in these payments, up to the ceilings agreed by the WTO.

Given the negative effects of economic recession, developed countries, which have the financial resources to implement expenditure policies in a non-trade distorting manner, should avoid imposing new trade restrictions. The situation is different for developing countries which lack the fiscal space to provide a stimulus to their economy. For these countries, import tariffs consist of the main policy instrument to protect their industries. However, as more developing countries trade increasingly with each other, including countries in Eastern and Southern Africa, increases in protection could harm low-income trade partners. Therefore, a prudent approach to border restrictions is recommended, so that policy responses do not further hamper trade, as concerted tariff increases by many countries will exacerbate the impact of economic recession on their economies.

Effective policies are also necessary in order to promote trade through expanding the supply of trade finance. As private banks account for about 80 percent of trade finance, developing countries' governments should aim at supporting institutions which experience liquidity problems due to the financial crisis. Already, the international community has taken a number of actions to meet the demand for finance by importers and exporters (see Box 8.2).

Nevertheless, policy responses including foreign currency injections and the provision of working capital may not feasible in developing countries. For example, low-income countries may not have sufficient foreign exchange reserves to support many importers, not strong enough financial institutions to provide export credit. These problems call for enhanced coordination of actions between trade partners. For example, Auboin (2009) proposes the creation of liquidity pools, possibly at a regional basis, allowing rapid co-financing between banks, export credit agencies and international players. Such pools may also aim at supporting finance in smaller segments of the market and, in particular, assist countries that are most likely to have been critically affected by tight credit, such as the least developed countries.

Governments can also engage in supporting trade finance, especially in countries in which the banking sector does not face serious liquidity problems, but is hesitant to extent credit. Firms with well-established exporting records that have repeated transactions with a range of established clients are more likely to obtain what bank finance is available and more likely to give and receive trade credit than other firms. Small firms with no established

BOX 8.2: TRADE FINANCE SUPPORT PROGRAMMES

Currently, the WTO is mobilizing international and national finance institutions to share some of the risk with the private banks. The WTO Expert Group for Trade Finance aims to:

- provide collective short-term solutions, notably by mobilizing government-backed export credit agencies and regional development banks; and,
- develop technical measures allowing for better synergy between private and public sector players in the short- and medium-term.

In more detail, since November 2008, regional development banks and the International Finance Committee have enhanced their trade facilitation programs, bringing the total capacity to US$7 billion on a roll-over basis, financing potentially some $30 billion of trade involving small countries and small amounts of US$250,000 on average by transaction.

Export credit agencies in developed countries and some emerging economies, such as China and Chile, have developed new programs for short-term lending of working capital and credit guarantees aimed at small and medium enterprises. In other cases, cooperation is developing to support regional trade, in particular chain-supply operations. The Asia Pacific Economic Cooperation summit announced the establishment of an Asia-Pacific Trade Insurance Network to facilitate intra and extra regional flows and investment through reinsurance cooperation among export credit agencies in the region.

The central banks in countries with large foreign exchange reserves have been supplying foreign currency to local banks and importers through repurchase agreements. Since October, Brazil's central bank has provided US$10 billion to the market. The Republic of Korea's central bank has also allocated US$10 billion of its foreign exchange reserves to facilitate trade finance. The central banks of South Africa, India, and Indonesia are also engaged in similar operations.

Based on Auboin (2009) and UNCTAD (2009)

relationship with clients along a supply chain, as well as new entrants are more likely to be affected (Humphrey, 2009). Government could share the risk with private banks, in both importing and exporting countries, by increasing the lending capacity in the system to target specific types of firms who are in need and provide sufficient foreign exchange and working capital.

Safety nets expansion, stimulus packages, export promotion and trade finance assistance in addition to infrastructure development and efficiency improvements, which are central in a low price environment, require large expenditures and an especially deep fiscal space. As many low-income countries struggle with large deficits, external financing is crucial in assisting countercyclical interventions. Already, the IMF and World Bank have expanded their lending capacity, however, the demand for liquidity by the emerging economies could deplete these resources very rapidly (Mold, Paolo, and Prizzon, 2009). The World Bank have also proposed a new 'Vulnerability Fund' created by contributions equal to 0.7 percent of the stimulus packages in the developed world (see Box 8.3).

Official development aid could provide such funds. If not, developing countries will resort to increasing their external and domestic debt with negative consequences for long run growth. In 2008, total net official development assistance (ODA) from members of the OECD's Development Assistance Committee rose by 10.2 percent in real terms to USD 119.8 billion. Although this is the highest aid figure recorded, it may not be sufficient. Bank

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BOX 8.3: MULTILATERAL DONOR FINANCING FACILITIES

The IMF Exogenous Shocks Facility (ESF) provides policy support and financial assistance to low-income countries facing exogenous shocks. It is available to countries eligible for the Poverty Reduction and Growth Facility (PRGF) - the IMF's main instrument for financial assistance to low-income countries - but do not have a PRGF program in place. Financing terms are equivalent to a PRGF arrangement and more concessional than under other IMF emergency lending facilities.

The World Banks' International Development Association (IDA) is one of the largest sources of assistance for the world's 78 poorest countries, 39 of which are in Africa. In December 2007 the IDA15 replenishment provided US$ 41.6 billion, an increase of US$9.5 billion over the previous replenishment (IDA14) which provided US$ 32.1 billion.

In January 2009, the World Bank also made proposals for a "Vulnerability Fund" for developing countries suffering in the global downturn, with developed countries allocating 0.7 percent of their economic stimulus packages. Such a fund could speed resources to existing World Bank, United Nations and regional development bank safety-net programs that give the poor access to health, education and nutrition services; build infrastructure such as roads, bridges and low-carbon technology projects; and support small and medium-size businesses and microfinance institutions that lend to the poor.

Based on the IMF's and World Bank's communiqués.

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rescues, stimulus packages, safety nets and export promotion may require a significantly larger amount. Such aid will be central in helping the world's poorest to face the costs of adjustment to the new economic environment, especially as low-income countries have not developed adequate social protection systems.

Although in the G20 London Summit, the developed world has reaffirmed its commitment to meeting the Millennium Development Goals and to achieving all ODA pledges, as the financial crisis deepens, it is possible that increases in aid may not be realized. Frot (2009) suggests that if donor countries behave as they did in the past, then the financial crisis will decrease aid budgets by sizable quantities. His empirical results stress that economic crises have important consequences on aid, decreasing aid budgets by 13 percent on average. In addition, crises change the aid's evolution, as donors tend to slow down, and sometimes reverse, the pre-crisis paths of aid budget expansion.

Without doubt more resources ought to be allocated to developing low-income countries to finance countercyclical policies, including the establishment of social protection nets and investing in long-term food security. An external financing facility for low income developing countries to support such measures would result to a fair distribution of the burden of the recession, especially as the current crisis is not caused by developing countries, and the reduction of their fiscal space is mainly due to the preceding price boom.

8.3 SUMMARY

Food price swings can result in major repercussions on the whole economy. For low-income food-importing countries, price booms can result in inflation and high import bills which in turn worsen the current account balance. As countries have to export more to pay for imports, such deficits may result in the depreciation of the exchange rate. The financial crisis and economic recession, although it did bring some relief to food importers through the food price drop, will negatively affect trade for commodity dependent countries

through weak demand for exports but also through decreases in the supply of trade finance. Declines in export revenues, and as investors revise their perceptions of risk for developing countries, shrinking capital inflows and foreign direct investment are expected to affect the long run path of development for many African countries.

The implementation of macroeconomic policies either fiscal or monetary, in response to commodity price changes requires a careful assessment of their impact on the broader economy. Food price shocks pose challenges that either necessitate macroeconomic policies or have macroeconomic consequences. Policy interventions in the wider economy aim at protecting consumers and vulnerable population groups by adjusting government revenue. During food price upswings, cuts in import tariffs and in taxes on food and the subsidization of food consumption, consist of fiscal options. During food price downswings, prudent trade policy, transfers to population groups hit by unemployment and active export promotion through the support of trade finance also present effective policy measures. As trade finance is hit by the financial crisis, governments should aim at sharing the risk with private banks, in both importing and exporting countries, in order to increase the lending capacity in the system to target specific types of firms which are in need of foreign exchange and working capital.

Such fiscal measures entail increased budgetary costs which will have to be met by increased government borrowing and disciplined housekeeping. Governments ought to set a borrowing target in line with the country's needs, and, in addition, impose discipline on a number of budgetary outlays so that expenditure results in a redistribution that favours the vulnerable. Targeted transfer programs that form part of an integrated social safety net system and well designed market-smart input subsidies may be preferable as instruments in providing support to the people in the lower ranges of the income distribution, while, at the same time, lead to reduced policy costs.

Annex
Summary of policies for the effective management of price swings

	Policy	Impact	Undesirable consequences and second round effects	Ability to target and to implement in a counter-cyclical manner	Constraints and conditions that determine effectiveness
Trade Policies	Lower import tariffs	offsets increase in the domestic price of food / increases food availability	loss of government revenue	straightforward to scale up - down	initial tariff levels should be relatively high; reduce tariffs on foods that are consumed by the poor
	Provide tax breaks for importers	offsets increase in the domestic price of food / increases food availability	loss of government revenue	straightforward to scale up - down	close cooperation between government and private traders
	Loan guarantees or subsidized loan interest rates for traders	provides adequate financing for traders if banks impose credit ceilings	may not result in sharing the risk between government and traders effectively	straightforward to scale up - down	close cooperation between government and private traders
	Export taxes or bans	offsets increase in the domestic price of food	weakens incentives to producers; windfall accrues to the public sector	straightforward to scale up - down	proper control and enforcement at the borders
Tax Policies	Remove VAT	offsets increase in the domestic price of food	loss of government revenue	straightforward to scale up - down	VAT system is in place; retail sector is competitive and well functioning; reduce taxes on foods that are consumed by the poor
	Lower income taxes	maintains purchasing power	loss of government revenue;	straightforward to scale up - down	Poor are not members of formal economy
Market management	Stockpiling and progressive release of food kept in food reserves	lowers domestic food price level when food is released at below market prices	high costs of open market operations; management may crowd the private sector out, or it may increase price volatility	scaling up and down incurs significant costs in terms of storage facilities and administration	transparent rules guiding government's intervention; greater consultation with the private sector; targeting through the release of grain for the processing of food products that are typically consumed by the poor

Social nets	Food aid (untargeted)	increase access to food if supply is not sufficient	low budgetary costs; aid can be diverted to undesirable consumption	straightforward to scale up - down	
	Universal food subsidies	maintain purchasing power of consumers	high fiscal burden; universal food subsidies consist of a short run policy option	difficult to scale down or remove completely	food is available so that subsidies do not put additional upward pressure on prices
	Targeted food subsidies, food vouchers, cash transfers	maintain purchasing power of the poor and vulnerable	high fiscal burden	relatively easy to scale up and down by changing the value of transfers and eligibility criteria; difficult to remove completely	food is available so that subsidies do not put additional upward pressure on prices; well designed targeting system
	Food/cash for work	enhances liquidity of beneficiaries	may result in replacing other activities if public work wage is not properly set up	easy to scale up and down	plans on feasible public works and investments that can be undertaken in times of need.
Production measures	Universal input subsidies	increase supply response and the availability of food	high fiscal burden; displace commercial sales	difficult to scale down or remove completely	inputs are available so that subsidies do not put additional upward pressure on prices
	Targeted input subsidies	assist beneficiaries to increase supply of food	not sustainable in the long run; may displace commercial sales depending on the effectiveness of targeting	relatively easy to scale up and down by changing the value of transfers and eligibility criteria; difficult to remove completely	inputs are available so that subsidies do not put additional upward pressure on prices; well designed targeting system
Financial services	One-time subsidies to rural finance institutions	reduce fixed costs of banking services in rural areas; increase access to financial instruments	may not result in sharing the risk between government and banks effectively	na	close cooperation between government and banks
	Subsidies on interest rates	increase savings/credit rates	may not result in sharing the risk between government and producers effectively	easy to scale up and phase down	close cooperation between government and banks; competitive rural banking sector
	Innovative savings accounts	increase access to financial services and credit	na	na	close cooperation between government and banks; competitive rural banking sector

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The 2007–2008 food price swing

Impact and policies in Eastern and Southern Africa

Between 2007 and 2008, the world experienced a dramatic swing in commodity prices. Food commodity prices also increased substantially during the summer of 2008, reaching their highest level in nearly thirty years, before decreasing sharply as expectations for an economic recession set in.

Eastern and Southern African countries experienced considerable difficulties due to the price food swing. The food price boom resulted in increased poverty and significant food security problems as households struggled to meet the high cost of food. At the macroeconomic level, high food import bills, inflation and foreign exchange constraints increased the fragility of developing and less developed countries. Although the ensuing world economic recession did lead to a drop in food prices, it carried with it a different set of problems. The decline in exports due to weak demand, decreased foreign investment and migrant remittances, as well as high unemployment all added to the burden of already vulnerable African countries.

Policy reactions to the food price surge have been prompt in many developing countries. A number of short-run measures in order to rein in the increase in food prices and to protect consumers and vulnerable population groups were introduced, such as reductions in import tariffs. Other countries resorted to food inventory management aimed at stabilizing domestic prices. A range of interventions have also been implemented to mitigate the adverse impacts on vulnerable households, such as targeted subsidized food sales. Other countries scaled-up already existing input subsidy programs to assist producers and stimulate supply response as fertilizer prices also soared.

The key objective of this Commodity and Trade Technical Paper is to discuss feasible policy approaches for the economic management of food price booms and slumps. As a first step to policy assessment, the paper also reviews the nature of the food price swing, analyses its impact on both household and wider economy levels and examines the policies that have been, or are currently being implemented in Eastern and Southern Africa.

The paper also examines a range of policies at the micro- and macro-economic levels that can help food producers and consumers adjust to price upswings and downswings. For price upswings, the paper discusses policies such as social safety nets, non-distorting market-smart input subsidies, prudent trade measures and market management, and efficiency enhancing interventions. Such policies together with good budget management can effectively offset part of the negative impact of food price surges. Similarly, as the economic recession leads to unemployment and poverty, the paper also focuses on countercyclical policies that can stimulate the economy, sustain exports and protect the vulnerable population groups. Finally, as the financial sector is experiencing significant problems globally, it is proposed that governments should also support the provision of trade finance to small and medium size firms.

This paper is part of the project 'Policies for Good Economic Management of Food Price Swings in African Countries' funded by the UK Department for International Development (DFID).